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American Veterinary Medical Association

FORMERLY

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(Original Official Organ U. S. Vet. Med. Ass'n.)

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The American Veterinary Medical Association

CONVENTION NUMBER

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OF THE

American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

H. Preston Hoskins, Secretary-Editor, 716 Book Building, Detroit, Mich.

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MINNEAPOLIS, THE 1928 CONVENTION CITY

It was a river that changed the frontier village of St. Anthony into the Minneapolis of today; a river sauntering along on its way to the Gulf, stumbling a little over rocks and falling with just enough force to turn the wheels of a flour-mill that was later to make the city famous.

It was a lake—several lakes in fact—that changed the scattered groups of houses into homes; lakes along whose quiet shores children and grown-ups alike bathe in summer and skate in winter; lakes sheltered by huge trees whose low-hanging branches almost touch their reflection below. And Harriet, Calhoun, Nokomis, Lake of the Isles, Cedar and other natural lakes within the city borders of Minneapolis are not the self-conscious man-made affairs to which many city park builders point with pride, but real yacht-going bodies of water with shore lines ranging from two to five miles in length. They have been dug and moulded and tree-fringed by the gigantic finger of old Mother Nature herself. Minneapolis seems a paradise to visitors not accustomed to seeing a bright blue lake every few blocks in their own city.

Located as it is on the Mississippi, at St. Anthony Falls, Minneapolis has become the focal point through which pass and return a great army of recreation and pleasure hunters of an entire country. It is not merely the last station on the line, from which the tourist is sent on to the beauties of the State, but combines within itself the unusual features of Vacation Land.

Modern, attractive and luxurious hotels provide comfortable quarters for the visitor to the city, who, on account of the lakes and parks in which Minneapolis abounds, can find here all of the delights which accompany a vacation spent at lakeside resorts. The wonderful system of boulevards encircling the city afford opportunities for long drives past the chain of lakes, through the beautiful and commodious parks, through residence sections of unusual attractiveness and along the picturesque banks of the "Father of Waters." And if one desires to go adventuring he can visit Minnehaha Falls, immortalized by Longfellow, follow the Mississippi to historic Fort Snelling, or drive to famous Lake Minnetonka a few miles out of the city, where he can dine at fashionable summer hotels or eat a picnic lunch at a suitable camp-site and glimpse the glorious beauties of this garden spot of nature. A drive around the meandering roads encircling Minnetonka is an experience not soon forgotten.

But while Minneapolis is known to many persons as a city of beautiful lakes, parks and residence districts, its industrial advantages are legion. It is tapped by 29 railroads, 9 of which are trunk lines centering in the city. It is the home of the Ninth Federal Reserve Bank and has 6 national banks, 27 state banks, 3 savings banks and 3 trust companies.

Ranking fifteenth among the cities of the country in the value of manufactured products, Minneapolis' industrial fame is built principally upon its flour-mills, which have a daily capacity of 79,550 barrels. It is the largest linseed-products center in the world, as well as the largest distributing center in the world for tractor and agricultural implements.

Minneapolis boasts over 1200 industrial establishments, covering 159 different types of industry.

Minneapolis long ago achieved a reputation as an educational center. Its system is being copied by various cities throughout the United States. It now houses 108 public schools and the University of Minnesota—the fourth largest educational institution of its kind, from a standpoint of attendance, in the United States. It is reputed as having the lowest percentage (1.2%) of illiteracy of any city of its size in the United States.

The Minneapolis Institute of Arts, the Walker Galleries, the Symphony Orchestra, known throughout the country, Schools of Music and Art, its libraries and other similar institutions stamp it conclusively as a cultural center. Its new three-million-dollar

auditorium now offers one of the finest convention meeting-halls in the United States.

Visitors to Minneapolis would not feel their sojourn here complete if they did not look in on the Chamber of Commerce, the nationally important grain exchange.

The city is justly proud of its Victory Memorial Drive also, several miles in length, flanked by 560 elms, each of which is dedicated to the memory of a Minneapolis resident who lost his life in the World War.

One of the city's most unique institutions is the Gateway Information Bureau of the Minneapolis Civic and Commerce

Minneapolis Gateway.

Association, situated in the beautiful Gateway Park section, equipped to give information and service of every description and character to Minneapolis visitors.

Last year over 460,000 inquirers were served at this bureau. Increased inquiries received over counter and by mail during the few months of this year indicate that 1928 will prove one of the most important tourist seasons from the standpoint of the number of visitors entering this city and the Ten Thousand Lake Region that this territory has ever enjoyed in the past.

Minneapolis has frequently been termed the gateway to the Ten Thousand Lakes of Minneapolis region. From here the

tourist may start on his journey to any sort of vacation resort his mind may picture. In Minnesota the tourist may drive over smooth well-kept highways, past prosperous farms, through groves of beautiful trees, along the shores of sparkling lakes, along the steep bluffs of the Mississippi or into the north country where the pointed pine trees whisper, foaming waterfalls beautify the rugged granite crags, or along the shore of the "Shining Big Sea Water" of the Indians—Lake Superior. He can lose himself in the wilderness to hunt and fish, or paddle a canoe for miles; he can live in luxurious summer hotels with golf courses, tennis courts, fine meals and other conveniences, or if he is so inclined, may rent a summer cottage or log cabin on the shore of a lake with a white-sand bathing beach—a lake where game fish abound.

Whatever the form of vacation pleasure he may seek in Minnesota, its crisp, invigorating air will send him back home with a new outlook. The invigorating air of the north pine country makes sick people well—hay-fever sufferers find relief in this district.

For information on Minnesota concerning resorts, fishing and hunting possibilities, hotels, lakes, or anything else in which a tourist would be interested, inquirers are directed to the Publicity Bureau, Minneapolis Civic and Commerce Association, Gateway Building, Minneapolis. This Bureau plans trips for tourists and gives automobile routings to points in the Northwest and all other sections of the United States.

Minnesota has what you want, so come to Minnesota and enjoy a real vacation among its scenic wonders. Minneapolis invites you to the land of sky blue waters.

Minneapolis, by the Waters of Minnetonka

TOURIST CAMPS

For those who desire information concerning tourist camps in and around Minneapolis, we offer the following:

Minneapolis' tourist camp is located in Minnehaha Park, in a beautiful site overlooking the Mississippi. Parking charge is fifty cents per car. This camp is convenient for those entering Minneapolis from the south and east.

Another tourist camp is located near Camden Park, in the northwestern section of Minneapolis. Others are to be found at Robbinsdale, Excelsior, Wayzata, Linwood and various Lake Minnetonka resorts.

MINNEAPOLIS HOTELS

Minneapolis is adequately supplied with hotels. The information concerning the hotels in the following list has been supplied by the Minneapolis Civic and Commerce Association. The official headquarters will be at the New Nicollet Hotel and the other hotels are listed in the order of their approximate distance from headquarters, varying from two to ten city blocks.

Hotel	Location	Rooms	Single		Double	
			Without Bath	With Bath	Without Bath	With Bath
Nicollet	Washington at Hennepin & Nicollet Aves.	600	$2	$2.50-$6	$3.50	$4-$8
Rogers	Nicollet Ave. & 4th St.	140	$1.25-$1.50	$2-$2.50	$2.50	$3.50-$5
Andrews	Hennepin Ave. & 4th St.	328	$2-$2.50	$2.50-$6	$3-$3.50	$4-$7
Vendome	4th St. bet. Hennepin & Nicollet Aves.	250	$1.25-$1.50	$1.75	$2-$2.50	$3-$3.50
West	Hennepin Ave. & 5th St.	362	$1.50-$2	$2-$4	$2.50-$3	$3-$5
Dyckman	6th St. bet. Hennepin & Nicollet Aves.	300		$2-$5		$4-$7
Radisson	7th St. bet. Hennepin & Nicollet Aves.	500	$2-$2.75	$3-$6.50	$4	$5-$30
Majestic	7th St. & Hennepin Ave.	112	$1-$1.50	$1.50-$2	$1.75-$2	$2.50-$3
Leamington	3rd Ave. S. at 10th St.	500		$2.50-$4.50		$3.50-$6
Curtis	10th St. & 4th Ave. S.	825		$2-$3		$3-$6
Sheridan	Marquette Ave. & 11th St.	450	$1.50-$2	$2.50-$4	$2.50-$4	$3.50-$6

Minneapolis, the Land of Hiawatha

MINNEAPOLIS GARAGES

There are five large parking garages located in the downtown section of Minneapolis, all within convenient distance from the New Nicollet Hotel, the official headquarters.

The Minneapolis Garage, with a 1000-car capacity, is located at Third Street and Second Avenue North, about two blocks away. The Standard Garage, at Third Street and Second Avenue South, is about the same distance from the Nicollet, in the other direction. The Frontenac Garage is at Fifth Street and Second Avenue South, two blocks further south.

Minneapolis, the Financial, Wholesaling, Jobbing, Retailing, Manufacturing, Distributing, Educational, Cultural Metropolis of the Northwest

THE LAND OF SKY-BLUE WATER

Read this. Then show it to your wife

The Subcommittee on Reception and Entertainment of Ladies, through Mrs. W. L. Boyd, chairman, extends to the wives, daughters and mothers of every member a very cordial invitation to attend the 65th annual meeting of the American Veterinary Medical Association in Minneapolis, August 7-8-9-10, 1928. The program arranged for the ladies is as follows:

Tuesday morning:	Attend opening session of the convention.
Tuesday afternoon:	Bridge—Five Hundred—Tea.
Wednesday morning:	A trip through the well-known Washburn-Crosby (Gold Medal) Flour Mills and luncheon at the mills.
Wednesday afternoon:	Meeting of the Women's Auxiliary to the A. V. M. A.
Wednesday evening:	Banquet.
Thursday morning:	Sight-seeing trip and luncheon at beautiful Lake Minnetonka.
Thursday evening:	Theatre party at the "Minnesota."
Friday:	An excursion through St. Paul and then to University Farm, University of Minnesota, for a picnic luncheon with the gentlemen.

The officers of the Women's Auxiliary are as follows:

President:	Mrs. C. E. Cotton, Minneapolis, Minn.
First Vice-President:	Mrs. C. H. Stange, Ames, Iowa.
Second Vice-President:	Mrs. L. W. Goss, Columbus, Ohio.
Third Vice-President:	Mrs. Arthur Spitz, Philadelphia, Pa.
Fourth Vice-President:	Mrs. Hamlet Moore, New Orleans, La.
Secretary:	Mrs. S. E. Hershey, Charleston, W. Va.
Treasurer:	Mrs. H. P. Hoskins, Detroit, Mich.

Minneapolis, the Gateway to the Ten Thousand Lakes Region

CONVENTION INSURANCE

In the advertising section of this issue of the JOURNAL will be found an important announcement concerning group accident insurance for those members who are planning to attend the Minneapolis convention. At a cost of $2.75, a member can secure coverage for a fifteen-day period (Aug. 1-15, inc.). The coverage granted is $2,500 for death and dismemberment, subject to the usual specific losses clause in the regular accident policy of the company, and $25.00 weekly indemnity for total disability for a period not to exceed 26 weeks. The proposition is subject to its acceptance by at least 100 members, and was approved by the Executive Board at the recent meeting.

MINNEAPOLIS PROGRAM

Through the splendid cooperation of the officers of the four sections, as well as those who will contribute to the literary program at Minneapolis, we are able to present a list of the papers that will be presented at the 65th annual convention of the A. V. M. A.

In its present form, this list of papers contains 43 titles, pretty well covering the entire gamut of veterinary science and including education, investigation, control work, food hygiene, and the different branches of practice—equine, bovine, porcine, ovine, canine, feline and avian. Even fur-bearing animals will receive attention.

Following is the list of papers, subject to slight changes or rearrangement that may be found desirable, between now and the time of the meeting:

SECTION ON GENERAL PRACTICE

1. Vulvovaginitis in Hogs—Dr. S. H. McNutt, Iowa State College, Ames, Iowa.
2. A Study of the Simultaneous and Serum-Alone Methods in the Treatment of Cholera-Infected Hogs—Dr. C. N. McBryde, U. S. B. A. I. Experiment Farm, Ames, Iowa.
3. Some Common Diseases of Sheep—Dr. W. L. Boyd, University of Minnesota, St. Paul, Minn.
4. Prevention and Control of Sheep Parasites in Pennsylvania Flocks—Dr. Henry W. Turner, Pennsylvania Bureau of Animal Industry, Harrisburg, Pa.
5. Diseases of Range Sheep—Dr. E. T. Baker, Moscow, Idaho.
6. Foreign-Body Cases in Bovines—Dr. E. E. Wegner, Dean, College of Veterinary Medicine, Washington State College, Pullman, Wash.
7. Returning the Uterus—Dr. E. E. Bittles, Waterford, Pa.
8. Poultry Problems in a General Practice, with Special Reference to Coccidiosis—Dr. John Patterson, Hedrick, Iowa. Discussion by Dr. E. P. Johnson, Michigan State College, East Lansing, Mich.
9. Breeding Diseases of the Horse—Dr. W. W. Dimock, University of Kentucky, Lexington, Ky.
10. Anaplasmosis in Cattle—Dr. George W. Stiles, U. S. B. A. I. Pathological Laboratory, Denver, Colo. Discussion by

Drs. L. R. Vawter, University of Nevada, Reno, Nevada, and Wm. H. Boynton, University of California, Berkeley, Calif.

11. The Practical Handling of Anthrax Outbreaks in Badly Infected Territory—Dr. O. M. Norton, Greenville, Miss.

SECTION ON SANITARY SCIENCE AND FOOD HYGIENE

1. Sensitivity, Infectivity, and Intertransmissibility of Tuberculosis—Dr. A. F. Schalk, North Dakota Agricultural College, Fargo, North Dakota.
2. The Practical Relation of Autopsy Findings to Field Work in Tuberculosis Control.—Dr. J. A. Barger, B. A. I. Inspector-in-Charge, Tuberculosis Eradication, Des Moines, Iowa.
3. The Present Status of Infectious Abortion Control from a Laboratory Standpoint—Dr. Ward Giltner, Dean, Division of Veterinary Science, Michigan State College, East Lansing, Mich.
4. Results from the Use of Huddleson's Vaccine for Bang's Disease—Dr. Ward Giltner and Dr. I. F. Huddleson, Michigan State College, East Lansing, Michigan, L. T. Clark and Dr. A. S. Schlingman, Parke, Davis & Company, Detroit, Michigan.
5. Johnin versus Avian Tuberculin as a Diagnostic Agent for Paratuberculosis of Cattle—Dr. W. A. Hagan, New York State Veterinary College, Cornell University, Ithaca, N. Y. Discussion by Dr. A. Zeissig, Ithaca, N. Y., and Dr. H. K. Wright, Philadelphia, Pa.
6. Regulatory Work with Bacillary White Diarrhea—Dr. B. T. Simms, Oregon Agricultural College, Corvallis, Oregon.
7. Some Obscure Diseases of Sheep—Dr. Hadleigh Marsh, State Live Stock Sanitary Board, Helena, Montana.
8. Rabies Control in Indiana—Dr. F. H. Brown, State Veterinarian, Indianapolis, Indiana.
9. Rabies Control in Michigan—Dr. B. J. Killham, State Veterinarian, Lansing, Michigan.

SECTION ON EDUCATION AND RESEARCH

1. The Only Source of Supply of the Profession—Dr. David S. White, Dean, College of Veterinary Medicine, Ohio State University, Columbus, Ohio.

2. The Essentials in Veterinary Education—Dr. George H. Glover, Dean, Division of Veterinary Medicine, Colorado Agricultural College, Fort Collins, Colo. Discussion by Dr. W. H. Feldman, Mayo Foundation, Rochester, Minn.
3. Undulant Fever in the United States—Dr. C. M. Carpenter, New York State Veterinary College, Cornell University, Ithaca, N. Y.
4. The Influence of Dietary Deficiencies on the Resistance to Disease—Dr. Solon N. Blackberg, Tulane University, New Orleans, La.
5. The Pathology of Sweet Clover Disease in Cattle—Dr. Lee M. Roderick, North Dakota Agricultural College, Fargo, N. Dak.
6. The Effects of *Trichostrongylus Axei* in the Stomach of the Horse—Dr. E. W. Price, Zoological Division, Bureau of Animal Industry, Washington, D. C.
7. Hemorrhagic Septicemia in Swine—A Study of One Outbreak—Drs. M. F. Barnes and A. L. Brueckner, Pennsylvania Bureau of Animal Industry, Harrisburg, Pa.
8. Further Studies on Enteritis in Swine—Drs. Charles Murray, H. E. Biester, S. H. McNutt and Paul Purwin, Iowa State College, Ames, Iowa.
9. Studies on Hog Cholera Virus—Dr. H. C. H. Kernkamp, Iowa State College, Ames, Iowa.
10. Fowl Cholera Studies—Dr. F. R. Beaudette, New Jersey Agricultural Experiment Station, New Brunswick, N. J.
11. The Immunizing Value of Atoxic Botulism Toxin (Botulism Toxoid, Botulism Anatoxin)—Drs. Robert Graham, E. C. McCulloch and E. A. Tunnicliff, University of Illinois, Urbana, Ill. Discussion by Dr. C. E. Salsbery, Kansas City, Mo.

SECTION ON SMALL-ANIMAL PRACTICE

1. Ultraviolet Light in Small-Animal Practice (Case Reports)—Dr. J. C. Flynn, Kansas City, Mo.
2. Open Reduction of Fractured Bones of Dogs—Dr. E. L. Quitman, Chicago, Ill.
3. Hookworm Infestation—Dr. S. W. Haigler, St. Louis, Mo.
4. Anatomy of the Dog (Illustrated)—Dr. J. D. Grossman, Ohio State University, Columbus, Ohio.

5. Emergencies Following Automobile Injuries to Small Animals—Dr. H. W. Brown, Fort Wayne, Ind.
6. Some of the Rarer and More Neglected Parasites of Dogs and Cats—Dr. E. W. Price, Zoological Division, Bureau of Animal Industry, Washington, D. C.
7. The Hospitalization of Small Animals—Dr. J. Elliott Crawford, Far Rockaway, Long Island, N. Y.
8. Observations on Canine Distemper—Dr. F. W. Wood, The Cutter Laboratory, Berkeley, Calif.

GENERAL SESSION

Thursday Evening, August 9, 8 P. M.

1. Results of Research on the Diseases of Fur Animals in Captivity (Illustrated)—Drs. R. G. Green, University of Minnesota, Minneapolis, Minn., and J. E. Schillinger, Bureau of Biological Survey, U. S. Department of Agriculture, Washington, D. C.
2. Fecal Examination for Evidence of Parasitism in Domestic Animals (Illustrated)—Dr. E. A. Benbrook, Professor of Veterinary Pathology, Iowa State College, Ames, Iowa.
3. The Danger to Man of Bovine and Avian Tuberculosis—Dr. Charles H. Mayo, Mayo Clinic, Rochester, Minn.
4. Researches on Bacillus Calmette-Guerin (B. C. G.): Experimental Vaccination Against Bovine Tuberculosis—Dr. E. A. Watson, Chief Pathologist, Department of Agriculture, Ottawa, Canada.

OUTLINE OF PROGRAM

MONDAY, AUGUST 6, 1928

MORNING....Committee meetings.
AFTERNOON..Meeting of Executive Board.
EVENING....Conference of accredited delegates from state, provincial and territorial veterinary associations.

TUESDAY, AUGUST 7, 1928

MORNING....Registration. Opening session, 10 a. m. Addresses of welcome. Response. President's address. Ladies attend.

AFTERNOON..General session, 2 p. m. Reports of Executive Board and officers. Ladies attend card party and tea.

EVENING....Meetings of college alumni groups, 6 p. m. President's reception and dance, 8 p. m.

WEDNESDAY, AUGUST 8, 1928

MORNING....Sectional meetings, 9 a. m. Papers. Ladies visit Washburn-Crosby (Gold Medal) Flour Mills. Luncheon at the mills.

AFTERNOON..General session, 2 p. m. Reports of Executive Board and committees. Election of officers. Women's Auxiliary meets.

EVENING....Banquet.

THURSDAY, AUGUST 9, 1928

MORNING....Sectional meetings, 9 a. m. Papers. Ladies go on sight-seeing trip—Lake Minnetonka—luncheon.

AFTERNOON..General session, 2 p. m. Reports of Executive Board and committees.

EVENING....General session, 8 p. m. Papers. Installation of officers. Ladies attend theatre party at the "Minnesota."

FRIDAY, AUGUST 10, 1928

MORNING....Clinic, University Farm, 9 a. m. Ladies go on excursion through St. Paul, thence to University Farm, for a joint picnic luncheon with the gentlemen.

AFTERNOON..Clinic continued, 1:30 p. m.

Minneapolis, the Gateway to the Ten Thousand Lakes Region

EXECUTIVE BOARD MEETING

An event of considerable importance took place the past month, namely, a special meeting of the Executive Board, held in the A. V. M. A. offices in Detroit. For some time it has been becoming more and more apparent that the time available at annual conventions of the A. V. M. A. is entirely inadequate for the successful transaction of the business to come before the Board at that time. There has been an interval of from seven to nine months between the two meetings of the Board held each year. The amount of business accumulating between the special meeting, usually held in Chicago, in December of

each year, and the annual meeting, held at the time of each convention, has become so great that it is impossible to dispose of it in an orderly and systematic way. No small part of the difficulty is caused by the counter-attractions incident to the convention, and the demands on the time of the members of the Board for other purposes.

In order to reduce the amount of business to come before the Board at Minneapolis, and to take care of numerous matters suffering for attention, a special meeting of the Board was called for June 6, in Detroit. Five of the seven members were in attendance, as well as President Hilty. Dr. T. E. Munce, chairman of the Board, called the meeting to order promptly at 9:30 a. m. The meeting was not adjourned until 10 p. m., and even then some business remained untouched. It is to be hoped that a special meeting can be arranged each year, about halfway between the usual Chicago meeting and the annual meeting. The advantages of holding at least one meeting each year in the offices of the A. V. M. A. were readily apparent to those who were in Detroit on June 6.

DR. T. E. MUNCE

Chairman of the Executive Board.

EXECUTIVE BOARD ELECTIONS

The elections of members of the Executive Board to represent Districts Nos. 2 and 3 came to a close on June 7. The balloting was unusually heavy, due both to the interest shown in the elections and the large numbers of members in the two districts. Approximately 500 votes were cast in District No. 2, with Dr. T. E. Munce, the present incumbent, leading the field. About 450 votes were cast in District No. 3, with Dr. L. A. Merillat, of Evanston, Ill., heading the list. The tellers declared Drs. Munce and Merillat elected for the five-year terms beginning at the close of the Minneapolis meeting. Dr. Munce is the present chairman of the Board and has been a member of the Board continuously since 1918. This is the first time that Dr. Merillat has been on the Board. He served one year as secretary (1916-1917) and one year as president (1924-1925) while the present form of government has been in effect, so he is quite familiar with A. V. M. A. affairs, and is eminently qualified to serve as the representative of the 900 members in Executive Board District No. 2, the largest in the Association.

Minneapolis, the Metropolis of the Northwest

REDUCED FARES TO MINNEAPOLIS

Application has been made for the certificate plan in connection with the Minneapolis convention. We have every reason to believe that the application will be granted and as a result members will be given the usual reduction of one-half fare for the return trip, if 250 certificates are presented at the convention. Under the plan, the round-trip fare will be one and one-half the one-way fare. It will be necessary to return from the convention city over the same route used in going to the meeting. Tickets reading either Minneapolis or St. Paul will be honored under the certificate plan. Be sure and ask your local ticket agent for a certificate when you purchase your ticket, even though you do not plan to use it. Every certificate will count. Present your certificate to the Secretary, just as soon after your arrival at Minneapolis as possible.

Consult the announcement of the Burlington Route in this issue of the JOURNAL, for special Pullman cars out of Chicago, St. Louis, Kansas City and Omaha.

APPLICATIONS FOR MEMBERSHIP

See May, 1928, JOURNAL

FIRST LISTING

BACHRACH, ALLAN — 5449 N. 11th St., Philadelphia, Pa.
V. M. D., University of Pennsylvania, 1928
Vouchers: G. A. Dick and C. J. Marshall.

BEARDSLEE, RUSSELL SIDNEY — 143 Temple St., Owego, N. Y.
V. M. D., University of Pennsylvania, 1928
Vouchers: Louis A. Klein and G. A. Dick.

BECK, JOHN DENGLER — 2404 West 16th St., Wilmington, Del.
V. M. D., University of Pennsylvania, 1928
Vouchers: Harvey L. Fell and G. A. Dick.

BLATCHFORD, CHANNING RUDOLPH — Brighton, Mich.
D. V. M., Michigan State College, 1926
Vouchers: W. N. Armstrong and B. J. Killham.

BROWNRIDGE, JOSEPH GARNET — Box 166, Stanton, Mich.
D. V. M., Grand Rapids Veterinary College, 1916
Vouchers: G. D. McIntyre and H. Preston Hoskins.

CALKINS, FRED P. — Sandusky, Mich.
D. V. S., Washington State College, 1909
Vouchers: H. C. Graham and B. J. Killham.

CASEY, LLOYD E. — 2221 Cedar Springs Rd., Dallas, Texas.
D. V. M., Colorado Agricultural College, 1922
Vouchers: A. E. Flowers and R. P. Marsteller.

CHIVERS, WALTER HARRIS — 215 Hyland, Ames, Iowa.
D. V. M., Iowa State College, 1928
Vouchers: W. F. Guard and John B. Bryant.

COLE, HARRY LEACH — 1518 N. Michigan Ave., Saginaw, Mich.
D. V. M., Michigan State College, 1928
Vouchers: Edw. K. Sales and H. Preston Hoskins.

COLLINS, CLAY R. — Osceola, Nebr.
D. V. M., Iowa State College, 1928
Vouchers: W. F. Guard and John B. Bryant.

DUNN, LUCIAN HENRY — Newell, S. Dak.
D. V. M., McKillip Veterinary College, 1918
Vouchers: M. M. Davis and M. W. Ray.

ESH, LEE MCDOWELL — 39th St. & Woodland Ave. Philadelphia, Pa.
V. M. D., University of Pennsylvania, 1928
Vouchers: G. A. Dick and Louis A. Klein.

FOELSCHOW, GEORGE W. — 739 4th St., San Diego, Calif.
D. V. M., San Francisco Veterinary College, 1916
Vouchers: W. L. Curtis and John L. Tyler.

GLASCOCK, DALE W. — Audubon, Iowa.
D. V. M., Iowa State College, 1928
Vouchers: W. F. Guard and John B. Bryant.

GRAF, CHARLES JOHN — Stuart, Iowa.
M. D. C., Chicago Veterinary College, 1907
Vouchers: C. H. Stange and H. D. Bergman.

HADDER, WALTER JONES — Mecosta, Mich.
D. V. S., Grand Rapids Veterinary College, 1909
Vouchers: Wm. Hansen and B. J. Killham.

HAGENBUCH, JOHN BERTRAM — 5050 Baltimore Ave., West Philadelphia, Pa.
V. M. D., University of Pennsylvania, 1928
Vouchers: G. A. Dick and C. J. Marshall.

HALE, MAURICE WENDELL, 1891 Beacon St., Brookline, Mass.
V. M. D., University of Pennsylvania, 1928
Vouchers: G. A. Dick and C. J. Marshall.

HARVEY, EBENEZER ERSKINE 50 S. Shelburne Rd., Greenfield, Mass.
D. V. M., Michigan State College, 1927
Vouchers: Henry D. Clark and B. J. Killham.

HUTT, CHARLES EDWARD 1233 N. Randolph St., Philadelphia, Pa.
V. M. D., University of Pennsylvania, 1928
Vouchers: Louis A. Klein and G. A. Dick.

JOHNSON, MARK M. 310 South Cerritos, Downey, Calif.
D. V. M., Washington State College, 1916
Vouchers: W. L. Curtis and John L. Tyler.

KELLY, THOS. L. R. D. Box 97A, Danbury, Ohio.
V. S., Ontario Veterinary College, 1896
Vouchers: F. E. Anderson and G. W. Cliffe.

MANN, REX I. Coldwater, Mich.
D. V. M., Grand Rapids Veterinary College, 1912
Vouchers: W. N. Armstrong and B. J. Killham.

MARTINDALE, WILLIAM EDGAR 1342 Harrison St., Frankford, Philadelphia, Pa.
V. M. D., University of Pennsylvania, 1928
Vouchers: G. A. Dick and Louis A. Klein.

MCARDLE, LEROY P. 109 7th Ave. N. W., Watertown, S. Dak.
D. V. M., Kansas City Veterinary College, 1913
Vouchers: C. F. Rathbun and J. O. Wilson.

MCCONNELL, ROY LEWIS
Box 65, Kansas State Agricultural College, Manhattan, Kans.
D. V. M., Kansas State Agricultural College, 1928
Vouchers: H. F. Lienhardt and J. H. Burt.

MCNELLIS, RUSSELL G. Janesville, Minn.
D. V. M., Iowa State College, 1928
Vouchers: W. F. Guard and John B. Bryant.

MEEHAN, GEORGE ARTHUR
634 Live Stock Exchange Bldg., South St. Paul, Minn.
D. V. M., McKillip Veterinary College, 1918
Vouchers: T. E. Totten and R. H. Harrison.

MEYER, E. F. 1839 Union Ave., Grand Rapids, Mich.
D. V. M., Grand Rapids Veterinary College, 1916
Vouchers: W. N. Armstrong and B. J. Killham.

MILLAR, JOSEPH AMBLER SHOEMAKER 705 Asbury Ave., Asbury Park, N. J.
V. M. D., University of Pennsylvania, 1928
Vouchers: Henry C. Millar and G. A. Dick.

MILLER, CLAUDE WILLIAM Biglerville, Pa.
V. M. D., University of Pennsylvania, 1928
Vouchers: Louis A. Klein and G. A. Dick.

ODERKIRK, CHARLES C. 1835 American Ave., Long Beach, Calif.
D. V. M., Cornell University, 1908
Vouchers: W. L. Curtis and John L. Tyler.

OVERMAN, VERNON B. Amboy, Ind.
D. V. M., Iowa State College, 1928
Vouchers: W. F. Guard and John B. Bryant.

PALMER, LYNN C. 2230 East Ave., R. R. No. 2, Kalamazoo, Mich.
D. V. M., Michigan State College, 1920
Vouchers: E. C. Goodrich and H. Preston Hoskins.

PERSCHBACHER, J. 117 Dodge St., Janesville, Wis.
V. S., Ontario Veterinary College, 1901
Vouchers: Arthur J. Knilans and James S. Healy.

POTE, THOMAS B. 4925 Park View Place, St. Louis, Mo.
D. V. S., McGill University, 1892
Vouchers: C. T. Snyder and E. A. Garleb.

RACKLEY, ERNEST WILLIAM 115 Stone St., Waynesboro, Ga.
V. M. D., University of Pennsylvania, 1928
Vouchers: Louis A. Klein and G. A. Dick.

RAHN, OSWILL B. Morgantown, Pa
V. M. D., University of Pennsylvania, 1914
Vouchers: R. L. Berger and T. E. Munce.

ROWE, TAYLOR PRESCOTT 316 N. Henry St., Richmond, Va.
V. M. D., University of Pennsylvania, 1928
Vouchers: H. H. Rowe and H. T. Farmer.

SCHALL, J. HUBLEY 801 N. 26th St., Philadelphia, Pa.
V. M. D., University of Pennsylvania, 1928
Vouchers: G. A. Dick and C. J. Marshall.

SCHUBEL, OTTO WILLIAM 89 E. Chicago St., Quincy, Mich.
D. V. S., United States College of Veterinary Surgeons, 1911
Vouchers: E. C. W. Schubel and W. N. Armstrong.

SHORE, CHALMER SCOTT Lake City, Minn.
V. M. D., University of Pennsylvania, 1901
Vouchers: R. Fenstermacher and C. P. Fitch.

STARKE, CHARLES FREDERICK Chestnut Hill, Philadelphia, Pa.
V. M. D., University of Pennsylvania, 1928
Vouchers: Louis A. Klein and G. A. Dick.

STEVENS, CLARENCE MARSHALL R. D. No. 4, Towanda, Pa.
V. M. D., University of Pennsylvania, 1928
Vouchers: G. A. Dick and C. J. Marshall.

WILSON, JAMES B. St. Croix Falls, Wis.
D. V. M., Kansas City Veterinary College, 1918
Vouchers: W. L. Boyd, R. Fenstermacher and James S. Healy.

WOOLEN, VERGIL W. 618 Fifteenth Ave. N., South St. Paul, Minn.
D. V. M., Colorado Agricultural College, 1921
Vouchers: G. E. Totten and Irvin Owens.

Applications Pending

SECOND LISTING

Abernethy, Pascal Macaulay, 320 Agricultural Bldg., Raleigh, N. C.
Bonneville, E. J., 1601 Venice Blvd., Los Angeles, Calif.
Bullock, R. E., Lebanon, Ohio.
Burgess, Delbert Roy, Grand Rapids, Minn.
Canion, Claude, 609 Congress Ave., Houston, Texas.
Cheney, John Baird, P. O. Box 61, Potsdam, N. Y.
Chenoweth, John W., Albany, Mo.
Dowling, Edmund M., 1325 Columbus Ave., Springfield, Mass.
Dudgeon, E. L., Platte City, Mo.
Duncan, W. T., 320 S. Benton Ave., Springfield, Mo.
Gentry, Lester Perry, Ottawa, Kans.
Jaeger, John A., West Concord, Minn.
Jaynes, Cornelia, 253 Nassau St., Princeton, N. J.
Johnson, Burnett Carpenter, 634 Live Stock Exch. Bldg., South St. Paul, Minn.
Johnson, Leo Rudolph, 920 East 19th St., Minneapolis, Minn.
Kagey, J. F., Kingsport, Tenn.
Larson, John J., Battle Lake, Minn.
McDaniel, John Samuel, Boonville, Mo.
Meyer, Earl H., Albion, Nebr.
Pieper, Fred Clarence, West Concord, Minn.
Raterman, Nicholas F., Fort Loramie, Ohio.
Ruggles, William Elmer, 13th and Couch Sts., Portland, Ore.
Ryan, Andrew D., Stewart, Minn.
Schlotthauer, Carl Frank, Mayo Foundation, Rochester, Minn.
Sears, Kirtley, 508 North Buchanan St., Maryville, Mo.
Simonds, Edward B., Riverdale, Md.
Smotherman, Ervin Cloud, Hillsboro, Texas.

Stuchell, H. Arthur, Luckey, Ohio.
Sullivan, Leo P., 1602 Pacific St., St. Joseph, Mo.
Tierney, Thomas L., Walnut, Iowa.
Townsend, Geo. F., 116 S. Kentucky St., Sedalia, Mo.
Warth, Arthur Lee, Garnett, Kans.
Whitcomb, Walter H., Plainview, Minn.
Woods, Millard M., Box 544, Mason City, Iowa.

The amount that shall accompany an application filed this month is $7.50, which covers membership fee and dues to January 1, 1929, including subscription to the JOURNAL.

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COMING VETERINARY MEETINGS

Illinois State Veterinary Medical Association. East St. Louis, Ill. July 5-6, 1928. Dr. W. H. Welch, Secretary, Lexington, Ill.

Alabama Veterinary Medical Association. Chamber of Commerce Room, Birmingham, Ala. July 7, 1928. Dr. C. A. Cary, Secretary, Auburn, Ala.

Chicago Veterinary Society. Great Northern Hotel, Chicago, Ill. July 9, 1928. Dr. J. B. Jaffray, Secretary, 2956 Washington Blvd., Chicago, Ill.

Vermont Veterinary Medical Association. Burlington, Vt. July 10-11, 1928. Dr. G. N. Welch, Secretary, Northfield, Vt.

British Columbia, Washington and Oregon Veterinary Medical Associations. Portland, Ore. July 9-10-11, 1928. Dr. J. W. Kalkus, Secretary, Puyallup, Wash.

Manitoba, The Veterinary Association of. Portage la Prairie. July 9-10-11, 1928. Dr. Wm. Hilton, Secretary, 510 Greenwood Place, Winnipeg, Man.

New York State Veterinary Medical Society. Coney Island, N. Y. July 11-12, 1928. Dr. C. E. Hayden, Secretary, 110 Irving Place, Ithaca, N. Y.

Kentucky Veterinary Medical Association. Henderson, Ky. July 11-12, 1928. Dr. C. G. Kreidler, Secretary, Maysville, Ky.

Kansas City Association of Veterinarians. New Baltimore Hotel, Kansas City, Mo. July 16, 1928. Dr. J. D. Ray, Secretary, 400 New Centre Bldg., Kansas City, Mo.

Southern California Veterinary Medical Association. Chamber of Commerce Bldg., Los Angeles, Calif. July 18, 1928. Dr. W. L. Curtis, Secretary, 1264 W. 2nd St., Los Angeles, Calif.

Western New York Veterinary Medical Association. Williamsville, N. Y. July 19, 1928. Dr. F. F. Fehr, Secretary, 243 So. Elmwood Ave., Buffalo, N. Y.

New Jersey, Veterinary Medical Association of. Asbury Park, N. J. July 19-20, 1928. Dr. E. R. Cushing, Secretary, Box 536, New Brunswick, N. J.

Maryland State Veterinary Medical Association. College Park, Md. July 19-20, 1928. Dr. E. M. Pickens, Secretary, College Park, Md.

Nevada State Veterinary Association. Reno, Nevada., July 20, 1928. Dr. Edward Records, Secretary, University of Nevada, Reno, Nevada.

Florida State Veterinary Medical Association. Tampa, Fla. July 23-24, 1928. Dr. A. L. Shealy, Secretary, University of Florida, Gainesville, Fla.

South Carolina Association of Veterinarians. Columbia, S. C. July 24-25, 1928. Dr. M. R. Blackstock, Secretary, 157 Hampton Ave., Spartanburg, S. C.

Northwestern Ohio Veterinary Medical Association. Findlay, Ohio. July 31, 1928. Dr. F. A. Lambert, Secretary, c/o Columbus Serum Co., Sta. C, Box 53, Columbus, Ohio.

Virginia State Veterinary Medical Association. Blacksburg, Va. July 31-August 1, 1928. Dr. Geo. C. Faville, Secretary, Hampton, Va.

Hudson Valley Veterinary Medical Society. Catskill, N. Y. August 8, 1928. Dr. J. G. Wills, Secretary, 122 State St., Albany, N. Y.

STATE BOARD EXAMINATION

Nebraska State Veterinary Examining Board. State House, Lincoln, Nebr. July 2-3, 1928. Director of Bureau of Examining Boards, State House, Lincoln, Nebr.

VETERINARIANS VISIT EUROPE

Dr. H. E. Bemis, Professor of Veterinary Surgery, and Dr. E. L. Stubbs, Professor of Veterinary Pathology, at the University of Pennsylvania, left for Europe on the SS. "Leviathan," June 5. Dr. Bemis was accompanied by Mrs. Bemis and will spend the summer at the Vienna Veterinary High School, making a study of special problems in surgery. Dr. Stubbs will visit the most important laboratories of pathology and bacteriology in France, Austria, Germany, England and Scotland.

THE DIAGNOSING AND SETTING OF FRACTURED BONES IN SMALL ANIMALS*

By C. P. Zepf, *New York, N. Y.*

A fracture is defined as a breaking or disunion of a bone or bony cartilage. In the larger cities, fractures are quite common among the small animals on account of the precarious life which they are compelled to live. The streets, congested with automobiles, and high apartment fire-escapes, with their concrete floors, where small animals are forced to secure their sunshine and fresh air, offer so many favorable opportunities for a mishap. Another reason why they are so subject to fractures is that they are possessed of a large number of extremities which, in the better class of dogs and cats, are of a weak quality due to close breeding. Frohner's *Veterinary Surgery* lists fractures as 2.5 per cent of all diseased conditions of dogs.

The frequency of fractures and the importance of properly setting and treating them is one reason why I have selected this subject. Not that I am attempting to force my methods upon you, for I feel that the method depends upon the conditions of the fracture, and the veterinarian must decide what procedure to follow in order to secure the best results. The result and impression, either good or bad, which may be left with the client, is the principal reason for selecting this topic. A good impression is left with your client when a fracture is scientifically treated and good results obtained; but a bad impression is left, when the fracture is improperly treated and new damage results, such as pressure necrosis to the extremity.

I will not attempt to enumerate the causes of fractures since it is the diagnosis and the result in which we are interested. I will attempt, however, to mention some of the symptoms and prognoses in discussing the methods I use in treating the common fractures encountered in small-animal practice. Neither will I attempt to discuss the pathology or process of the union of bones, except to mention the approximate length of time required for the fracture to remain in splints or cast until the wounded part becomes strong enough to support the weight of the animal for, if proper conditions exist, nature takes care of that very well.

*Presented at the sixty-fourth annual meeting of the American Veterinary Medical Association, Philadelphia, Pa., September 13-16, 1927.

In the treatment of fractures the veterinarian's task is replacing the broken ends of the bones into their proper position and holding them there until nature completes the process of healing. He must always remember that his patient, dog or cat, may not agree with the way he has done the job and may try to undo it. On the other hand, the patient may not adhere to strict hospital rules, thereby doing harm to himself; for example, by continually jumping or walking, or using the affected part, he may cause the bandage to cut or gall him.

The replacement of the broken ends of bones is best accomplished when the dog or cat is under anesthesia, preferably morphin, H. M. C. or chloral. This prevents the struggling of the animal and causes relaxation of the muscles so that the broken ends can more easily be replaced and held while applying treatment. Not only is it important to have the animal under anesthesia for successful treatment, but also for the satisfaction of the owner who, in the majority of cases, will request it. In my opinion it is almost impossible to set fractures of some dogs successfully without having them under an anesthetic, to help restrain and relax the muscles. In cats, the anesthesia can be obtained by the use of chloral or luminal. Having the patient under an anesthetic serves another purpose, especially in cats, but also in the case of some dogs, it is a very wise plan to keep them under a hypnotic for some time, for unless you do, in a large number of cases, they will either slip out of the bandage or cast, or bring about a disunion of the fractured ends before they finally consent to stop fighting to free themselves of the cast. I want to caution veterinarians to take special pains in applying treatment to fractures of cats, lest they find that the patient has either pulled the part free or dislodged it.

As to the type of material or the best method to use in the treatment of fractures, I do not care to pass a definite opinion, since I have not used all the types suggested by our text-books. I think that this problem should be solved by the veterinarian. He should use the method and the materials most applicable to the case, for good results can be secured with any, if they are properly applied.

Some other important points which I wish to bring out, before taking up the different fractures, are dangers for which to keep a keen eye when the fracture is once treated. So frequently after the treatment is applied one forgets about the case for three or four weeks. If the case remains in the hospital, it is

not bothered with, or if the owner takes it home, he is advised to remove the treatment in a certain length of time, as the case may require. This practice should not exist, for it is very important that a close watch be kept, especially for the first ten days, to see that the ends remain in apposition, that the cast properly adjusts itself, and that no necrosis sets in. Again, some dogs, especially puppies, will need to be kept quiet. They will forget after the pain leaves that they are being treated. In these cases steps can be taken to keep them quiet; hobbles or a very small cage may be used.

The owner, as a rule, takes everything for granted, especially if you send the case home. He thinks that the setting is all there is to it and pays no more attention, except to mark the date when he is to remove the treatment. Why, I have had clients call me on the 'phone a few days after the setting of a leg and tell me that they have had their dog for a walk around the reservoir and how wonderfully the dog handles the leg. Others say: "Our dog is feeling fine. He played ball with my husband all last evening." That same client will take none of the blame when the cast is removed and the parts are not united, or when the dog is brought back all galled. If we could keep our patients quiet, I believe our results would be almost 100 per cent, for fractures in dogs and cats heal very readily. Then, too, we should not make a fracture such a trivial affair.

Fracture of Mandible of Jaw

This may occur in one or both mandibles simultaneously and in different positions. If there is a fracture in only one mandible, there is very little difficulty in treating it. In fact, some, if the ends are in apposition, are better left alone, unless a compound fracture exists along the root of a tooth. In that case, extract the tooth, and then by bandaging the mouth in a closed position, the ends will, in most cases, unite. If both mandibles are fractured the treatment will depend on the position of the fractures, the type of animal, and its attitude toward being bandaged about the mouth. I have obtained fair results, after placing the ends in apposition, by bandaging with splints around the nose, holding the lower jaw against the upper, and feeding liquid foods through a pocket at the back of the mouth. In some cases I have obtained fair results by using silver wire between certain teeth and aluminum plates on the under side; while in other cases it was absolutely impossible to keep any form of

treatment on the patient. In some cases it is best to leave the patient alone and feed liquid foods. It is surprising what a large number will heal with but little deformity if they are left alone. Do not immediately advise that the animal be destroyed. Try them and see what can be done.

Fractures of the Ribs

Fractures of the ribs are important to the veterinarian only so far as diagnosis and prognosis are concerned to determine whether any internal injury, such as puncture of the lungs, has occurred, or whether an external wound has been caused. The veterinarian, however, should attempt to assist healing by replacing the ribs and bandaging around the chest, running a number of plies in a figure-eight in front of the shoulders in such a way that the bandage cannot slip back. On top of the bandage, it is advisable to put adhesive tape. The adhesive tape forms a treatment that will not stretch. This type of bandage will limit the movement of the chest as much as possible. Some treatment should always be attempted for the satisfaction of the client. One should always watch for complications and they should be considered in the prognosis.

At this point I shall give a description of the general procedure which I carry out in the setting of fractured limbs and this description will apply, in a general way, to any bone. First, I restrain the patient; then placing the ends of the bone in apposition and having an attendant hold them so, I apply a padding of a good quality of cotton; then I use bandage enough to hold the padding in position. After this, I apply the splints, which have been shaped to suit the fracture, and again bandage until I have the part so that it cannot be moved out of place. After this, I apply adhesive tape. The adhesive tape, I think, serves a number of purposes. It does not allow parts of the bandage to work loose; it prevents the dog from getting hold of threads of the bandage and starting a desire to chew it off; it places an equal pressure on all parts by preventing the bandage from drawing on certain parts when the dog moves.

An injury to the scapular region, such as a fracture of the scapula or rupture of the scapular attachments, is treated by bandaging the scapula tightly to the body, thus preventing movement. This can be assisted by using heavy pasteboard, shaped and large enough to allow it to be bent around the margins of the scapula. The pasteboard overlapping the front

part of the scapula will assist in keeping the shoulder from being pulled up along the neck, thus allowing movement. This can be reinforced by a splint to prevent the pasteboard from bending. The forearm and leg should be splinted and bandaged as well, so as to prevent movement of the scapula. To bandage this, of course, one must go around the chest and therefore must take pains to pad the opposite armpit thoroughly to prevent the dog or cat from becoming chafed or cut by the bandage while walking.

An injury to the brachial plexus or one of its branches is very common, and cannot be treated very successfully. The only reason why I am mentioning it in my paper is that it is very important to make sure that it is not complicated with a fracture when one is giving a prognosis to the owner; for if a rupture of the brachial nerves should be present, the dog's leg will undoubtedly always hang in a slung position from the shoulder. The differential diagnosis can be made readily by the dropped position of the shoulder, and the inability of the patient to extend the leg. In a fracture the parts are held close up to the chest and the leg can be extended but with severe pain. Fracture to the scapular region is usually due to a blow from a car, or from running into objects and, therefore, it can very easily be complicated with an injury to these nerves since they are so exposed.

Fractures of the Humerus

Fractures of the humerus are treated by having an attendant stretch the whole leg in a straight position, thereby pulling the humerus free from the side of the chest and holding it thus until treatment is applied. After getting the ends in apposition, and applying the padding and the bandage, I apply two splints, one to the median, and one to the front side of the fracture. Then to hold the leg in this extended position, I apply a strong splint, shaped to conform to the shape of the leg, and extending to the toes; I also allow this splint to bend over the back. By bandaging this splint over the back and the full length of the leg, the fractured parts are prevented from relaxing and moving out of apposition. Now, of course, this is not the natural position for the leg nor for the humerus, the part affected, and, therefore, these are points one must consider.

Naturally, stretching the leg has a tendency to throw the upper part of the humerus forward, and the lower part back-

ward. This is prevented by the median and anterior splints being applied directly to the fracture. They should not be long enough to interfere with or come over the joints, since this would make correct healing almost impossible. I would also suggest that the anterior splint be fairly strong. On the other hand, one must be careful in bandaging around the elbow joint and the pisiform or carpal bone, since one must bandage quite tightly to hold the leg in a straight position. Any difficulty in this respect, however, can be overcome by not drawing the bandage too tightly over these parts, and, in a day or so, after the adhesive tape and bandage are properly set, cutting the plies directly over these parts, thus relieving the pressure. I always include the foot in the bandage, packing between the toes with cotton, to secure equal pressure to all parts of the leg. I do not, however, have the splint extend over the foot unless there is a break in that part, for, in walking, the dog is likely to cause an injury. Very often the material I use for the long splint is secured from the ordinary bushel basket. It already has the natural bend to fit over the back and about the proper length. This material, if carefully taken apart, can be shaped up very well by simply soaking it in water.

The length of time required to remain in treatment depends on the age and size of the animal. In young puppies in good health, eighteen days will be long enough, while in older dogs it may require from three to four weeks. The prognosis of this break is usually very good.

Fractures of the Radius and Ulna

Fractures of the radius and ulna will be taken up together, since they are usually complicated in injury, or, in other words, both must be treated in order to treat the one successfully. In splinting, I allow the splints to extend slightly above the elbow joint, to keep the elbow joint immovable and down to the foot, thus keeping the carpal or wrist joint immovable also. I use four splints—one on the median, one on the anterior, one on the lateral and one on the posterior side of the fracture. On the posterior side, I use a short splint, so that it does not interfere with the pisiform bone. Over this bone, it is a good policy, a few days after the leg is properly adjusted, to relieve the pressure by cutting the strands of bandage and adhesive tape in the same manner as described in the setting of the humerus. I do not bandage around the chest for this fracture. The length

of time for healing is the same as in the case of the humerus. The prognosis is usually very favorable.

Frequently one encounters an injury to the elbow joint, either a dislocation or a separation of the radius and ulna at the joint, without a fracture. This is treated in the same manner as a fracture of the radius and ulna, only making doubly certain that there can be no movement of the elbow joint. The prognosis of this injury is not so certain, since a stiff joint may be left, after healing, depending upon the amount of injury to the joint-capsule.

Fractures of the Metacarpus

A fracture of the metacarpal bones is treated in the same manner as a fracture of the radius and ulna, except that I include the digits in the splints so as to keep them immovable. The length of time and the prognosis are the same as for any other break.

In a fracture of one or more of the digits, I bandage and splint the whole foot, the same as in the case of a break of the metacarpal bones, excepting that I allow the splints to extend a little longer, about a half-inch, so that the splints serve as a sort of stub foot, not allowing the foot to come in contact with the surface. I find it necessary to keep the whole leg up to the elbow immovable, in order to secure good results and to have the treament remain in place. In bandaging around the foot one must be careful not to bandage too tightly and cause pressure necrosis, especially to the dewclaw. It is always well to pack between the toes with absorbent cotton before bandaging.

Frequently we have brought to us a dog with an enlarged, diseased toe, which, the client tells us, has existed for some time. In the majority of cases this is the result of a fracture that was not treated, or of some other injury to the bone. In my mind, this condition could have been prevented had the foot been treated and kept immovable at the time of injury. Quite frequently the veterinarian treats an injury to the toes with little concern, thinking that they do not need to be splinted, and the result is a diseased toe. Fractures of the digits should always be treated. (About the only treatment that I can suggest for a diseased toe, especially if there is any amount of exostosis, is the amputation of the affected part.)

Fractures of the Spine

A fracture of the spine is difficult, both from a diagnostic and from a treatment standpoint. An X-ray is frequently the only definite means of telling what actually exists. The treatment depends on the severity of the case, the complications present, and the attitude of the owner toward attempting to save the animal. The prognosis, of course, must always be made very serious.

Fractures to the pelvic bone will be considered as one, in my description, since the treatment for them is the same. The principal thing to do is let them alone and keep the animal quiet. I find that to bandage just annoys the patient. Usually fair results are obtained if the animal is kept quiet. The veterinarian should, however, attempt to place the parts in apposition. This can frequently be accomplished through the rectum. The diagnosis can readily be made by a rectal examination and by the peculiar weak back movement of the patient. One not infrequently encounters a separation of the pelvic bones and the sacrum. The diagnosis is sometimes confused with a fracture, since the visible symptoms are similar. In the case of a separation of the sacrum and pelvic bones, I think one should bandage around the body of the pelvis, to assist in holding the parts together. By so doing a cure will be effected more quickly.

Fractures of the Femur

In taking up a fracture of the femur, I shall say here that the treatment which I shall describe is principally to satisfy the client who desires that something be done, and not that I expect much better results than if I left the injury alone and merely kept the dog quiet. I think that a fracture of the femur is the most commonly difficult fracture that the veterinarian encounters. The animal, it appears, gets the front end of his body out of the way of trouble, but the rear gets hit. A fracture of the femur is difficult to treat because the heavy muscles surrounding it prevent treatment being applied directly to the part affected. If the fracture is in the upper part, as the head of the femur, treatment is practically useless.

The treatment that I use, if any, is about the same as for the fracture of the humerus. I apply three splints directly to the fracture—one on the median, one on the lateral, one on the anterior side and then one long splint, shaped to the leg and allowed to extend over in apposition. By having the lateral

splint of good, strong quality and extending the full length of the leg and over the back, one can keep the leg stretched in a large percentage of cases, holding the ends of the bone in apposition. The principal difficulty in treating the back leg of a dog, when compelled to go around the body, especially in a male dog, is the trouble encountered in keeping the bandage clear of the penis and from cutting into the flank. This can be eliminated to a great extent by carefully padding with cotton directly at these places.

The length of time required for the femur to heal is possibly a little longer than in most fractures, about four weeks being required, but as a rule I do not leave the bandage on more than about two and one-half weeks, especially if it galls or cuts into the flank, for after the bone once starts to unite, so that it remains in apposition, the treatment can be removed. The dog, having four legs, protects it very well.

Dislocation of the Hip

Dislocation of the hip, where the femur is pushed out of the acetabulum, occurs occasionally, but frequently it is confused with a fracture of the head of the femur. The differential diagnosis can be made by crepitation and pain, if a fracture; while, if a dislocation, one can usually feel the head projecting up and no crepitation. The treatment of a dislocation consists of replacing the head of the femur in the socket and bandaging to hold it so, until the ligaments readjust themselves. This is not very difficult if in a very young dog and shortly after injury, but if severe lacerations occurred to the joint ligaments, accompanied with a large amount of extravasation of blood into the joint-socket, replacement is almost impossible. The length of time the affected parts need to be bandaged is only a few days; in fact, in some cases, replacement is all that is necessary, although it is always advisable to bandage to prevent recurrence. The prognosis should always be guarded, although the treatment is successful in the majority of cases.

Dislocation of the Patella

The patella is a very small, elongated bone, held in position by a single ligament attached to the femur and tibia, assisted by grooves in the femur and tibia. This condition may occur on both sides but more often only on the inner side. It is very common in the smaller breeds of dogs, such as Pomeranians and Bostons, due to their decided activity in contrast to their delicate

anatomy. This condition usually results from a jump or fall. I have had it happen while restraining dogs.

The diagnosis is not difficult, since the animal holds the leg in a characteristic flexed position, if in the early stages, and by examining the stifle joint the patella can be felt on the side; then, by straightening out the leg, it will move back in place. The veterinarian can usually differentiate between a chronic or recent injury by the pain shown by the animal.

The patella is very readily replaced by bending the leg backward and straightening it as much as possible; then by manipulation it will slip into position. Frequently the dog will walk away as though nothing had happened, although it is always advisable to apply treatment, since it is likely to recur. If the disease becomes chronic and dislocation occurs frequently, so that the stifle joint is thick and the dislocation can be produced or replaced by pressure, treatment is of no use. The prognosis is good if treated immediately after the injury has occurred, but unfavorable in chronic cases.

The treatment I use after replacing the patella is to bandage the leg in splints, holding it in a straight position. I usually advise that the bandage be left on for about a week. In chronic cases cure can sometimes be effected by slightly blistering the part and then bandaging as described above and allowing the bandage to remain on for about two weeks.

The treatment for the fractures of the tibia and fibula is the same as for the ulna and radius. Also fractures of the tarsal bones and phalanges are treated the same as fractures of the carpal bones of the front leg.

Compound Fractures

In compound fractures I follow the same procedure as in the subcutaneous forms; that is to say, I splint and bandage the broken ends in apposition, to have the fracture heal, while at the same time I treat the external wound. The antiseptic treatment of the external wound, before the bandage is applied, must be most thorough. After the bandage is applied, to continue the treatment of the external wound, which in most cases is necessary, an opening is cut through the bandage to the wound, thus allowing air and access for daily dressing. If the wound is very thoroughly cleaned with antiseptics before the bandage is applied, boric acid powder to keep the area dry will frequently be all that is necessary for the after-dressing. The prognosis of a compound fracture must always be guarded.

Discussion

Chairman LaCroix: It seems to me, in general practice—and I do not believe that it is recorded in our literature—in the application of splints in small animals we should observe great care in cleansing the skin and disinfecting it before applying bandages, which are to remain ten days, or two weeks, or longer. The point is that in addition to the importance of distributing pressure equally, it is highly important to see that the parts are cleansed, especially if extremities are involved.

Dr. E. T. Ryan: I would like to ask Dr. Zepp whether, in the fracture, he begins at the top or at the bottom, and also, if he completely covers the whole fracture of a long bone, especially, say, from an elbow down.

Dr. Zepp: In the case of a break in the long bone, I endeavor to prevent, of course, the parts from slipping, and go over it as evenly as possible. If the break should be in the tibia, I would start there with a bandage and then go down to the foot. Thus you get your bandage worked into a formation that, when you go around the splint, it has something to hold it to the affected part.

As to the cotton, I apply plenty and bandage quite a bit before I put the splints on. I attempt to have the cotton securely bound to the leg, and, in fact, before I put the splints on I would like to feel that the leg is in such a shape that nothing would give or unroll in the cotton. Then I apply the splints, thus giving them a distinct surface to be applied to. As to the length of the splints, for instance, if it should be a tibia, I bandage from above the joint down to the end of the foot, but the splints extend only to the ankle and do not go over the toes. I do not apply splints over the foot since in walking it will spread; thus may cause pressure necrosis of the toes.

Dr. Ryan: The reason I brought up this question was this. I find that if you bandage from the point of the break down to the toe, you are inclined to drive the blood and circulation down. If you start at the toe and work your bandage up, by holding the splints in position, providing the fracture is reduced properly, and by carrying it that way, we find that you will not have a whole lot of swelling at the toes.

As to covering the leg completely with the cotton, about two years ago a Great Dane that I had, received a compound fracture. This dog was bandaged with the splints only on the inside, the outside being wrapped in cotton. I could open up the bandage without disturbing the fracture at all.

Dr. Zepp: After the patella is replaced, the object in bandaging is to keep the joint immovable and in the natural position. This is accomplisehd by two splints, on lateral and median sides of the patella joint. I do not attempt to apply splints directly to the patella.

In the chronic cases that I mentioned in the paper, I have gotten results by blistering. In these cases we sometimes left the air wall out, because I do not like to let it go long until I apply the splints. When you are blistering you must be careful in applying treatments and excluding air.

Dr. Ryan: I understand Dr. Zepp to say that he did not use plaster of Paris.

Dr. Zepp: I use cotton, bandage, splints and adhesive tape. The cotton should be of good quality. The bandage size should depend on size of the patient, and the splints should be of the best material to be had. A good material is that used in the manufacture of ordinary bushel baskets (slat type). It may not be strong enough for large dogs. In that case, I use the human splint. On the outside I use adhesive. This can be had in the wide roll or narrow. I think the adhesive protects the bandage and prevents pressure on any particular part.

As to bandaging around the foot, I do not believe I bandage tight enough to interfere with the circulation. Of course, there are cases that are set by men who do not realize the seriousness of this particular phase.

Dr. J. C. Flynn: There is one material that I do not believe was mentioned, that makes a very good splint, and that is Yucca board. You can buy Yucca board in six-inch widths and 36-inch lengths. To soften it, drop it in a bucket of hot water. When you get ready to use it mark out the shape you want, and then take a pair of scissors and cut it. Shape it the way you want it.

Shape it to the limb and bandage it. It dries there and it is pliable enough so that it does not hurt the animal. Yet it is stiff enough to give you the support you need. I like it very much for splint material.

DR. RYAN: I would like to have Dr. Zepp supplement his paper by telling us what, in his opinion, in cases of fractures of the femur, is the best splint?

CHAIRMAN LACROIX: How about the Thomas splint?

MEMBER: The splint I have in mind is an improvement on the Thomas splint, but I do not recall its name. You put the brace up to the foot and use your elastic bands from the top of the brace, and you get good results. If there are five or six or ten inches sticking above the dog's back, that does not make any difference, but it is annoying to the dog at his foot. I have been using it on dogs for the past five years, and, with the exception of the first one, I had good results.

DR. ZEPP: I use a large strong splint of material that will bend, shaped to the leg and allowed to extend bent over the back and down to the ankle. Then by bandaging the splint to the lower part of the leg so that it cannot slip and the part bend over, the back bandaged down tight to the back will help keep the femur in a stretched immovable position.

POULTRY DISEASES RECEIVE ATTENTION

The establishment of a Poultry Disease Division in the Pennsylvania Bureau of Animal Industry, with Dr. Robert O. Biltz in charge, has been announced by Dr. T. E. Munce, director of the Bureau. This step has been taken because of the increasing importance of the poultry industry and the great losses suffered each year from preventable diseases. Each year has brought greater demands upon the Bureau for assistance in poultry disease regulatory work.

The Bureau is charged by law with putting into effect regulatory measures in connection with the prevention and control of transmissible diseases of poultry. It is the purpose of this Bureau to lend assistance to the poultry industry through the local practicing veterinarians.

The laboratory and field forces will work in close cooperation in the consideration of problems in connection with transmissible diseases of poultry. These combined forces will assist local veterinarians in the diagnosis and treatment of transmissible diseases including parasitoses.

Investigational work also will be conducted on an extensive scale. This will be facilitated by the increase in the size of the laboratory force and the more adequate facilities in the new laboratory and on the experiment farm.

Dr. Munce states that Dr. Biltz has been associated with the Bureau in its field and laboratory poultry disease work for a number of years and is eminently qualified to head the new Poultry Disease Division.

THE VALUE OF THE X-RAY IN THE DIAGNOSIS AND TREATMENT OF FRACTURES IN SMALL ANIMALS*

By E. E. PATTERSON, *Detroit, Mich.*

As many of you men know, the general public nowadays, especially owners of small animals, are demanding of veterinarians a higher type of professional service than ever before. This condition has been very apparent during the past four years. During this time, I have been using an X-ray machine and, even though I have not become a roentgenologist, I believe I have found out some things that will be interesting to you men, particularly those specializing in small-animal practice.

On January 23, 1896, Roentgen read a paper before the Physical Medical Society, at Warnsberg, announcing his discovery of the X-ray and within a few months, skiagraphs of bones of the hands appeared in every newspaper that could afford illustrations, and the reporters indulged their imaginations and dwelt on the advantages the new discovery would bring to medicine and surgery in general. The strangeness of this subject, however, offered an unusually brilliant field for the imagination and humorous mind, and in consequence it took years before the public was disabused of its first erroneous impression.

First, I am going to tell you a little about the machine in general use; also the type of machine used in our clinic. We use the Fisher standard-make X-ray, capable of delivering a five-millimeter spark and a ten milliamperage, capable of producing a skiagraph of the bones or organs of an animal, weighing 200 pounds or less, in less than six seconds. There are a number of good X-ray machines on the market today and all are constructed on the same plan. However, there are different classes of work. The best type adapted for taking bone pictures, or doing fluoroscopy, is the machine to which I have just referred.

Most all machines are made with oil-immersed transformer of the closed-core type, for stepping up the voltage from the ordinary 110-volt light circuit to a voltage of between 7,500 to 10,000. All modern machines use the Coolidge radiator tube. This tube has a filament for the cathode similar to the filament in an incandescent lamp, and has an anode with a Tungsten-

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steel cap and copper shank attached, which shank is a small flange radiator for radiating the heat generated by the high-volt current passing from the cathode and striking the anode. X-rays are generated in the Coolidge tube, due to the fact that in lighting this cathode filament ions are liberated; then by applying the high-volt current, which travels from the cathode to the anode, these ions are driven against the anode with terrific force. On striking the anode the X-ray is generated and flies off at right angles to the anode.

In selecting an X-ray apparatus, I have kept constantly in mind its use, especially in small-animal practice. The greatest value that one may receive from the use of the X-ray machine is in connection with fractures in small animals. As we all know, X-ray pictures are indispensable to the physician in diagnosing the ailments of human beings, and I claim they are just as essential in diagnosing certain ailments and conditions in small animals, especially where there is a possibility of a fracture.

I will also endeavor to show you, with some lantern-slides, why an X-ray machine is indispensable in small-animal practice; where fractures have been mistaken for luxations, and vice versa; where fractures have been treated with external applications, and so-called luxations in various animals which never have occurred. I feel that not only in the great city of Detroit are these great errors made, but in other large cities, where automobiles and dogs are very plentiful. Without the aid of the X-ray machine these so-called conditions are not going to be alleviated properly. However, I do not wish to have anyone go away with the impression that it is impossible to diagnose fractures and other conditions in small animals without the aid of an X-ray machine. But, it gives one that satisfaction of seeing the true condition that does exist, such as needles, slivers, and other sharp objects that get into the feet of animals; also foreign bodies, either in the trachea or esophagus, and especially needles in the esophagus of cats. This work all can be done with the aid of the fluoroscope and enables one to arrive at a positive diagnosis. X-ray work with veterinarians is comparatively new, and I know of nothing that gives more prestige to the profession at this time than the X-ray machine.

I have not said anything here relative to the taking of the plates, but I will refer you to an article by Horning, which recently appeared in the JOURNAL of the A. V. M. A. No doubt

FIG. 1. Fracture of head of femur.

you all have read this article. However, I can not help but say a word or two, that all pictures should be taken from one or two angles, so as to show the exact location and relations of the break. It is possible to set fractures under the fluoroscope, but not with this type of machine. We use skiagraphs altogether, for two reasons: first, the picture enables one to work directly under its outline; second, you can show the exact position of the fracture to your client, thus satisfying his desire to see exactly what did occur. I am not going to take up your time discussing fractures of the human family. As you know, there are 157 varieties of fractures, and each fracture has a distinct name. However, from your own knowledge, I will refer you to the works of Frederic J. Cotton on fractures, and Frederic W. Bancroft and Charles L. Scudder, on bone fractures. These are very excellent contributions to the medical profession. However, this paper deals exclusively with fractures of small animals.

Diagnosis of Fractures With Aid of X-ray Machine

Ninety per cent of the fractures of small animals can be diagnosed upon physical examination and no doubt that percentage will be about correct for fractures that are brought into your hospital, but in the other ten per cent—and maybe I am making the percentage small when I say ten per cent—the true condition is not completely revealed. This has been the experience in our own clinic. When we manipulate a fracture—we may take the tibia, for example—and endeavor to place a cast upon it after the bones are perfectly adjusted and brought into proper apposition, and we place it in a cast, or splint the leg with yucca board, believing that the leg is in perfect position, and send the patient home, or put him in the hospital, feeling that this animal is going to make a complete recovery from the nice setting of the fracture, one would really be surprised were he to take a picture after going through this manipulation and find that the two bones are completely out of alignment. This condition is one that I am going to show with lantern-slides later on.

Reduction of Fractures and Care of Patients in Our Hospital

When an animal is brought into our hospital to have a fracture set, if it is a simple fracture, of any of the long bones outside of the femur or humerus, we immediately endeavor to immobilize the entire extremity, by placing on yucca board and

FIG. 2. Parallel healing of fracture of femur.

adhesive tape, so as to allow some motion to the limb and endeavor to make the cast as light as possible. These long-bone fractures are allowed to go home with instructions that the patient must be kept quiet and returned to the clinic in six days. At the end of that time the cast is thoroughly examined and if any necrotic odors are present, we immediately replace the cast. Regarding an X-ray plate, we do not insist upon one being taken, unless the client so desires. However, we do not refrain from trying to sell a picture, because the majority of people like to see exactly what is taking place.

Fractures of the humerus, femur, vertebrae and pelvic bones come under a different heading. We insist that a picture be taken to show exactly what and where the trouble is, giving the true interpretation of the condition existing. We find in doing so that we have many more satisfied clients, irrespective of the outcome of the patients.

In treating reducible fractures of these bones, we will take the humerus and the scapula first. Plaster of Paris jackets are used almost exclusively. Fractures of the femur are handled entirely differently, according to the size of the animal. These animals are placed in small quarters, anywhere from 3 by 4 up, according to size, and bedded in clean dry sawdust. Clients are not allowed to see the patients for three weeks. At the end of three weeks, if the patient is making a recovery, we allow the owner to see him, but nothing whatsoever is done to the leg. The patient is not allowed out of his room for this length of time. At the end of six weeks, we allow the patient to go home.

Fractures of the pelvis are usually handled in the same manner, although sometimes adjustments of the various fractured parts are so manipulated as to bring them in proper apposition. At no time do we use plaster of Paris, tape, or anything upon the animal with fractures of these bones. Personally, I feel it is nothing more nor less than malpractice to do so.

Osteology, Constituents of Bone and Bone Repair, Theories of Bone Repair

The chemical composition of bone is as follows (Sisson): Gelatin, 33.30; phosphate of lime, 57.35; carbonate of lime, 3.85; phosphate of magnesia, 2.05; carbonate and chlorid of sodium, 3.45 per cent.

The repair of injuries of bones differs in one respect from the repair of other tissues, which are essentially dependent on the

FIG. 3. Bird-shot in flesh of hind leg.

formation of fibrous tissue. In the skeleton we have favorable conditions—bone reproduces bone. Capsular tissue reproduces itself in fibrous new growth, and even the endothelial joint layer is reproduced. Ideally we may have perfect repair. In fact such a repair occurs in dislocations, not uncommonly, and in fractures when there has been no malposition. In practice there is apt to be either absence or else restriction of motion from over-repair of dislocations and over-growth of bone in the callous that welds together separated fragments in fractures. Some temporary over-growth, or callous, is almost alway spresent and extreme cases are not rare.

The conditions favoring callous formation and bone growth are imperfectly understood, but we may formulate the following rules: The primary callous is dependent for its mass on the primary blood clot and the cellular infiltration of the surrounding tissues. The ossification of the fracture, starting in the primary callous, proceeds in the main from the inner side of the periosteum, which is stripped off more or less extensively. The outer side of the periosteum seems to take no part as a starting-point of ossification. It furnishes no osteoblastic cells. Callouses may unwrap muscles or tendons, but they are not a part of the bone-forming repair. Callous formation, between bone ends and the internal callous arising from the marrow, has a part to play later; but it has little to do with the bone formation in the provisional consolidation, which is what we know clinically as firm union.

The merging of tissue into real bone union is a long process and does occur, but that is long after the case has been discharged as cured.

Parallel bone formation also does occur, with the restoration of the marrow cavity, but I can not advance a theory as to why, or how, bone reabsorption does or will take place. I shall endeavor to show one of these so-called parallel bone healing formations that took place after a lapse of fifty days. In most cases all that concerns the practitioner in fractures is such as permits motion without pain. We also seek a union sufficiently firm to permit the use of the limb without danger. It is surprising to learn how early in some patients this process of repair reaches that end. Bone possesses, as do the other supporting tissues, a large proportion of intercellular substances. The diaphysis of a long bone consists of compact bone substance, while the ends of the epiphyses are composed of more spongy

FIG. 4. Fracture of tibia.

bone. Beneath the cortical shell of compact bone are canal spaces and haversian canals, in which blood-vessels lie. Between and around these canals are smaller connecting spaces, lacunae containing bone cells. Around the haversian canals the bone lacunae are arranged in concentric rows. From the fibrous periosteal covering, connective tissues enters the bone on all sides.

Bones considered as organs are made up of bony tissue, periosteum and central bone marrow. The latter consists of blood-vessels and nerves supplying the different parts of the bone. The periosteum has an outer fibrous layer containing nerve plexuses and blood-vessels, and an inner, delicate, less vascular layer, rich in connective tissue cells. In the inner layer of the periosteum lie cuboidal cells, osteoblasts, which play an important part in the development and regeneration of bone. Throughout the cavity of the long bones is a space filled with the bone marrow which enters the haversian canals. The bone periosteum and the bone marrow are supplied with blood-vessels; these enter the periosteum, supplying largely the outer lamellae of the cortical bone. The blood-vessels of the marrow arise from the nutrient artery of the bone. There is an intimate capillary anastomosis between all the vessels.

Non-Union of Bone

Non-union usually means delayed union and many times destruction of the patient. The reasons for delayed union are many. To enumerate: improper reduction, badly fitting splints, rachitis, anemia, distemper, old age, lack of calcium, or deficiency of inorganic bone-forming elements of the blood, many times lack of proper diet, due to the lack of proper phosphorus content. These are the theories that I advance. To prevent non-union in the treatment of every fractured bone it is very important that the surgeon should carefully safeguard the care and treatment of the patient, that he may preclude the possibility of any deviation from the normal healing. Therefore, I say once more that animals with fractures should be under the care of the veterinarian until a firm union has been established. First of all, it is the doctor's duty to see that the immobilization of the parts is satisfactory, so that there is a minimum amount of motion at the seat of fracture; second, that the circulation of the parts is good; third, that the fracture is well reduced; and fourth, that you know that it is well

FIG. 5. Luxation of femur from acetabulum.

reduced, and that you may have the proof of such with an X-ray picture, not only in one, but in two plates, and in serious fractures plates may be taken every ten days, in order to show exactly what is taking place. I can recall at this time but very few cases that have left our hospital where union had not taken place; however, I do recall some cases in fractured femurs that were taken out before they were in shape to leave.

Spontaneous Fractures

From my own observations upon rachitis in puppies, I can say that fractures do occur spontaneously in the femur, tibia and fibula of young dogs. I give a case report of a litter of four Italian wolfhounds. These puppies were born late in September, reared under very favorable conditions, under good sanitary conditions, but were not allowed to get upon the ground; they had the best of feed and excellent care generally. At two months of age a streptococcus infection entered their lives; treatment was given with apparent immediate results. However, at eighty days from the time these puppies were born, one of the puppies became lame behind. Upon examination I found a fracture of the distal end of the femur, and upon further examining the shaft of the femur, unfortunately I fractured the proximal end of the bone. This was the first puppy down; he was destroyed. One week later the two puppies were brought into the clinic, all showing the same symptoms. These two puppies also were destroyed. The fourth puppy was placed in a riding academy and has never had a sick day. I will show you the bones of these three puppies for your own observations. I wish to state that all these puppies had vast quantities of cod-liver oil, and were given the quartz-light treatment daily for ten days, after which time no apparent results were obtained, and the puppies were destroyed.

Conclusions

It appears to me that the time is right for the veterinary profession, more especially the small-animal practitioner, to focus his thoughts on better and more modern methods of diagnosing ailments of the small animals, and in saying this I have reference to the X-ray machine. Basing my opinion upon four years of personal observation in constant contact with this machine, also the great store of valuable observations that one may receive and record in his daily work. I place the X-ray at the top of the list in any well-equipped veterinary hospital for the

great value one may receive from it; also as a practice-builder there is nothing to compare with it. I furthermore feel that we are fortunate today in not only having the X-ray as an accessory method of diagnosis, but in having, as a result of this diagnostic method, a vast array of observations made directly at operations and material for deductions, not accessible to a previous generation. Wisdom did not begin with this generation, but we have an unusual opportunity at the present time to learn. It is with this same spirit that I quote from Dr. Charles Locke Scudder's *Treatment of Fractures.*

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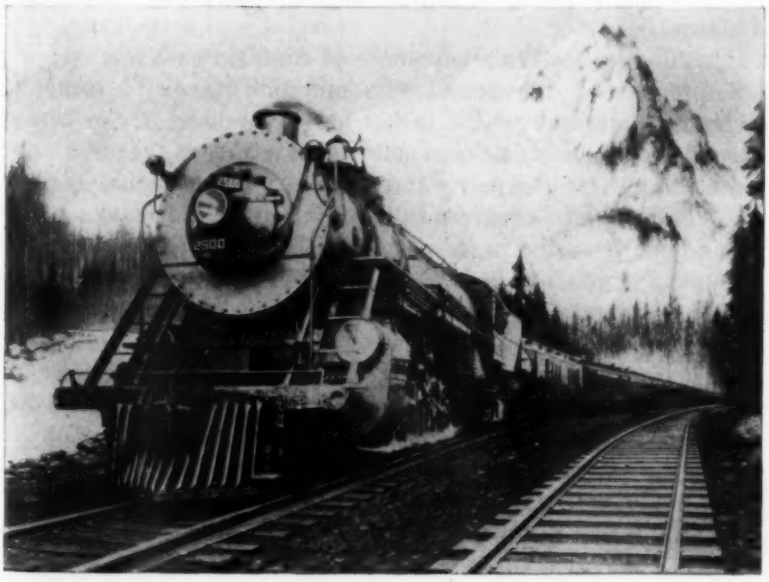
ON THE WAY TO MINNEAPOLIS



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TREATING FEMUR AND PELVIC FRACTURES

By A. J. STEINER, *Lexington, Ky.*

It was the writer's pleasure to hear the papers on fractures presented by Drs. Zepp and Patterson at the 1927 A. V. M. A. meeting, but on account of adjournment following their presentation it was not his privilege to enter into discussion. It seemed that both papers stressed the writers' inability to set femur fractures, as most cases reported were destroyed. Inasmuch as I have had remarkable success in treating such fractures, I feel that a brief description of the methods used may prove beneficial to my fellow practitioners, and at the same time prevent unnecessary destruction.

In the last three years about forty cases have been treated and, to my knowledge, only two of these were later destroyed. Both of the latter were distal-end fractures. In three of the cases both femurs were fractured, and in a number of others the pelvis also was fractured. While it has not been possible to check up on all these cases, only a few of those later observed showed any resulting lameness, and that usually from a slightly shortened leg, but not objectionable to the owner. A brief description of my first and later most interesting case will demonstrate what can be accomplished in femur and pelvic fractures.

On June 16, 1924, a six-months-old Airedale with a broken leg was presented for treatment. Examination revealed a complete oblique fracture about 2-3 inches below the head of the femur. Rectal examination disclosed complete fractures of the acetabular branches of both the pelvis and ischium. Being unable to meet the situation, I called in consultation a physician who is a recognized bone specialist in this city. With his assistance an unique plaster cast was applied, but an X-ray picture proved its fallacy and it was removed. After a number of suggestions on his part, a feasible method of treatment was decided upon. (Method, somewhat modified, is described later.) The animal was kept in a semi-suspended position for seven days at no apparent discomfort and then taken down and allowed the freedom of its kennel. For several days the hind legs were practically paralyzed from muscular fatigue and disuse. The animal soon gained use of its uninjured leg and got around nicely on its three good legs.

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At this stage the animal was dismissed from the hospital and not observed again for several months, when carriage and gate were perfectly normal A slight enlargement of the femur at the point of fracture remained.

On January 15, 1925, the same dog returned with complete transverse fractures in the middle third of each femur. It was again placed in an arrangement, as previously used, for ten days, when all restraint was removed. In two days the dog was dismissed with instructions to let the animal lie quietly until ready to use its legs of its own accord. The owner reported in two weeks that the animal was using the hind legs some and was gradually getting stronger on them. About three months later the writer saw the dog running on the street with no lameness evident. About a year after the last injury, the dog was in the hospital and examined closely. The legs were normal except for a slight thickening of the bones at each fracture.

Description of Author's Method

The method used for setting the fractures in the case described above is a modification of that occasionally used on humans. It consisted of partially suspending the animal by its hind legs in a sling-like arrangement made as follows: A piece of board (cigar box) about two inches square is placed midway on a strip of adhesive tape 2 inches wide by about 30 inches long. the length depending on the size of the dog. A small hole is bored through both board and tape. Two such pieces are needed—one for each leg. The wooden block is used to prevent pressure of the tape against the foot. The adhesive is then heated and with the board held about one inch beyond the foot, the adhesives are plastered along the lateral and medial surfaces of the leg. In long-haired dogs it is advisable to clip the hair from the legs first. The adhesive should extend from the foot to the stifle on the injured leg and may extend to the back on the uninjured leg. Small half-inch strips of adhesive are run loosely around the leg above and below the hock to hold the underlying tape in place. A gauze bandage is then loosely wrapped around to protect the adhesives. The same procedure is followed on the other hind leg, regardless of whether it is injured or not. A small sash-cord or heavy braided twine is then passed through the hole in the board and knotted on the side nearest the foot, so that it cannot come through. The dog is then placed on its back in a well-bedded kennel and the ropes are passed through two small

pulleys which are attached to the top of the kennel. These pulleys are placed a little farther apart then the natural distance between the legs. The ropes are pulled up until the dog's hips are barely off the floor. Unless both legs are broken the foot of the injured leg should extend up about an inch higher than the uninjured leg. The two ropes are then knotted together on the far side of the pulleys so that the hind legs will remain fully extended. The free end of one rope is then run through a third pulley farther back and a weight sufficient to take up any slackening of the rope caused by the movements of the animal is applied. These ropes occasionally have to be readjusted.

The traction on the legs soon causes muscular fatigue and the broken bones are brought into as perfect apposition as possible by the stretching and pressure of the muscles. It is advisable to examine the leg at the end of the first day to see that the bones are properly set. In some cases it is necessary to tie the head of the animal to the opposite end of the kennel so that it can not get to the bandages or work itself around its hind legs. This is usually removed, however, after the first or second day and the dog is allowed to assume any position it wants. The ropes may have to be untwisted occasionally.

Few Dogs Object to Treatment

At first thought one would not believe that a dog would tolerate such confinement, and it is surprising how complacently they take it. In my experience only two have objected strenuously and they were both young fox hounds.

The fractured bone apparently knits together in five to ten days, depending on the nature of the fracture and the age of the dog, and with the care that a dog takes of an injured leg it will continue to heal properly after the animal is set free.

The other method used that will give good results in certain cases is the cast; however, it does not always give the results obtained from the previously described method. This treatment is used particularly on certain transverse fractures, especially of small dogs. No attempt is made to set the leg until 24 to 36 hours following injury, so that the swelling will have reached its limit and will not cause unnecessary removal of the cast later. The animal is suspended at a convenient height by tying ropes from its legs over a board the width of the animal's body. An assistant holds up the head and keeps the dog from struggling. A single piece of heavy cardboard is then placed

under the hips and bent up along the legs, leaving a half-inch space between the back and the board. Trace on it the outline of the legs and cut, allowing for slightly more flexion in the hocks. The cardboard can be made to conform to the hips and rump by cutting out the fullness and applying adhesive to hold it in shape. A piece of strong steel wire, $\frac{3}{16}$ or $\frac{1}{4}$ inch in diameter, is bent and shaped to go around outside of the board and is attached with adhesive. A piece of board is then cut to conform to the medial surface of the injured leg, and is also reinforced with wire. By the time the cast is prepared, the muscles of the leg have fatigued so much that the bone can easily be set. Cotton is placed under the case and bandages are applied, starting at the hocks. Before bandaging around the hips, the cast is pushed forward as far as possible and adhesive strips are placed from it to the body to hold it in place. It is then bandaged completely by running the bandage around the abdomen and between the legs. The hocks are then slightly flexed, so that they can not recede into the cast, and bandaged. When the entire cast is tightly bandaged, plaster of Paris bandages are applied and allowed to dry. The dog is then taken down and placed in a kennel where it usually sits on its rump or lies recumbent for a day or so, when it realizes that it can stand on the casted legs and hobbles about. At this time it is imperative that you watch the abdomen in front of the cast, so that pressure necrosis does not take place. If the animal has a tendency to chew at the cast, a wrapping of bicycle tape will frequently prevent it. The cast is left on from one to two weeks, or until it is too loose to be of any service.

VETERINARY SANITARIANS APPOINTED

Mr. W. G. Campbell, Director of Regulatory Work, Food, Drug and Insecticide Administration, U. S. Department of Agriculture, announces the following appointments of veterinary sanitarians in connection with the enforcement of the Federal Import Milk Act. Announcement of civil service examinations for these positions was made in the January issue of the JOURNAL.

Dr. George Smith, Jr., of Toledo, Ohio, has been appointed as an Assistant Veterinary Sanitarian. Drs. Fred W. Graves, of Wolcott, Ind., Chas. W. Gates, of Chicago, Ill., Harry P. Stout, of Zeigler, Ill., and Murray J. Dills, of Decatur, Ill., have been appointed as Junior Veterinary Sanitarians, all for duty at the Rouses Point (N. Y.) Station.

THE EXAMINATION OF FECES FOR EVIDENCES OF PARASITISM*

By B. M. UNDERHILL, *Philadelphia, Pa.*

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If there is reason to suspect that an animal is harboring parasites at all, there will then be brought to mind several first-line considerations, as to which may be mentioned specific susceptibility, exposure, age, environmental habit, diet, physical condition, and symptoms. The value of such diagnostic factors will, as in other evidence, be proportionate to the diagnostician's knowledge of the parasites with which he has to deal. Knowing in detail the biology of the common parasites of his animal, they will contribute to the conclusion, not only as to the presence of the parasites, but as to their kind and location as well. For diagnosis of roundworm and usual flatworm parasitism of the alimentary tract, we are fortunately not confined to the rather atypical symptomatic evidence.

Gross examination of alimentary discharges, as feces or vomit, may reveal complete or fragmented parasites, though here, as in other such evidence, if there are at the same time anemic and general malnutritional indications in the host, we should guard against too hasty conclusion as to cause and effect. Often animals in such condition are harboring parasites as a coincident contribution to faults which must be looked for elsewhere. Needless to say, however, the animal in any case should be relieved of its parasitic burden, whether heavy or light, as one of the first considerations toward its improvement or recovery.

Relative to the results obtained in fecal examination for parasitic eggs, it is a matter of interest that we are aided in this by the biologic phenomenon of adaptive modification. It is true as to the parasitic habit in general that it involves a hazard in the perpetuation of the parasitic species, the degree of which will be greater or less according to the phylogenetically acquired dependence upon a host and mode of propagation. Relative to this there is a compensatory development of the reproduction function involving the production of an enormous number of eggs, of which only an infinitesimal number can reach such transmission as will make possible a new generation.

*Presented at the University of Pennsylvania Conference for Veterinarians, Philadelphia, January 4-5, 1928.

The daily egg production of several species of parasitic worms has been estimated by a comparison of the number of worms obtained by treatment with the egg output as determined by the dilution egg count (Brown and Cort, *Journal of Parasitology*, December, 1927). By this method Stoll (1923) obtained about 9000 eggs per day for a female of *Necator americanus*, the American human hookworm. Cram (1925) has estimated that a single female of *Ascaris lumbricoides* may contain as high as 27,000,000 eggs. Brown and Cort report the case of a five-year-old boy who was found to be passing in fecal output for a single day approximately 10,064,000 ascaris eggs. After treatment seventy-seven ascarids were obtained, forty-three of which were female, giving about 234,000 eggs per day for each female.

Numerous methods of preparation of fecal material for the microscopic detection of parasitic eggs have been described, some requiring a considerable array of apparatus and laboratory equipment. The process which I have chosen to demonstrate to you is one of several based upon relative specific gravity of eggs to dilution in which they are contained, either of which can be quickly carried out with but few utensils. In my own experience I have obtained quite satisfactory results with the concentrated sugar solution method which first came to my attention by way of a reprint of an article upon the diagnosis of intestinal parasites by Dr. E. A. Benbrook, professor of pathology at Iowa State College. Dr. Benbrook states that the method was originated by Dr. A. L. Sheather, assistant director, Research Institute in Animal Pathology, Royal Veterinary College, London.

In the demonstration of the process you will note the very few utensils required and the rapidity with which it may be carried out. The sample of feces should be of generous size, for the dog, up to as much as can be heaped upon a tablespoon according to size of animal and material available. For the horse and sheep there should be at least as much as will half fill a quart Mason jar. Sufficient water is added to the sample to make a thinly fluid mixture in which the harder particles are broken up and well stirred. Formed and lumpy dog feces should have about three parts of water added to one of feces, horse feces equal parts, and sheep pellets about three parts of water to one. To remove the coarse material the mixture is strained through an ordinary flour-sifter, with a mesh of about thirty per inch. The fluid obtained is now poured into several ordinary test-tubes or centrifuge-tubes, up to about one-third of their capacity,

and to each of the tubes there is added an equal amount of the following solution: granulated sugar one pound, water twelve ounces. This stock solution may be made by up immersing the vessel (unstoppered) in hot water, adding phenol or formol one per cent as preservative. After adding this solution, gently mix it with the fecal fluid by slowly inverting each tube several times. The tubes should now be allowed to stand without being disturbed for eight to twelve hours, or, if a centrifuge is available, they may be centrifuged for a few minutes at about 1500 revolutions per minute.

While standing, the eggs, being lighter than the fluid, will concentrate at the top, from which they may be transferred to a microscopic slide by touching the surface with a glass rod or the finger tip. The slide, with or without cover-slip, is now placed upon the stage with microscope tube in vertical position. Low-power objective should first be used and too high an illumination avoided, as this will obscure detail.

Though it is stated that the tubes containing the prepared material, if not centrifuged, should stand for eight to twelve hours or more, I have obtained by this method numerous Strongylus eggs from horse feces within three hours after receiving the samples. In any case, and especially in small-animal work, it is well to inquire whether oil has been recently given previous to securing the fecal sample. Oily feces will prevent satisfactory results in that the oil will rise to the top and interfere with the collection of the eggs upon the surface. Several fluid agents other than sugar solution are in use for the purpose of rapid parasitic diagnosis; these include glycerin and saturated watery solutions of calcium chlorid or sodium chlorid. The process with either of these is, of course, based upon the same principle, that of relative specific gravity, and they may be carried out with the same utensils and by the same simple procedure as here demonstrated.

DOCTOR MAYO ADDRESSES INSPECTORS

Dr. N. S. Mayo, of North Chicago, Ill., addressed the meeting of the Veterinary Inspectors, held at the Union Stock Yards, Chicago, on June 11. The subject of his talk was "The Veterinary Profession at the Present Time and the Probable Future Trend." Dr. Mayo emphasized the important part that the A. V. M. A. has played in the development of the past and urged the Bureau men to join the Association and give it their active support.

THE EPIZOOLOGY OF BOVINE COCCIDIOSIS

By LEE M. RODERICK, *Fargo, North Dakota*

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Reports of the "bloody diarrhea" in young cattle which come to our attention are almost pathognomonic for intestinal coccidiosis. Further inquiry invariably reveals that the characteristic symptoms and course of the disease exist in the affected animals. Moreover, the fecal examinations regularly confirm such tentative diagnoses by the finding of the oöcysts of the parasitic protozoa.

Occurrence: Bovine coccidiosis, or "red diarrhea," is cosmopolitan in its distribution. The reviews of Knuth and du Toit[1] and of Railliet[2] refer to many European and African studies. The 6th German edition of Hutyra and Marek[3] and the English translation thereof specifically state that the disease occurs almost exclusively during the summer months (June to September) and particularly in wet years. Most of the animals commonly become infected on pasture and especially in mountainous areas while rarely in the lowlands. This applies no doubt to conditions in Switzerland where the studies were made and where the disease was epizootic. It was recognized a few years ago, when the extent of the disease had attained serious proportions, that a different situation prevailed in North Dakota. The purpose of this paper is to contrast the influences here which may govern the occurrence of the disease with those reported elsewhere.

The disease has been reported by several observers in various localities in North America, including Schultz,[4] in Washington; Marsh[5] and Welch, in Montana; Smith and Graybill,[6] in New Jersey; Dykstra,[7] Muldoon[8] and Frank,[9] in Kansas; Lentz,[10] Barnes and Brueckner,[11] in Pennsylvania; Bruce,[12] in British Columbia; Gwatkin,[13] in Ontario; and Way and Hagan,[14] in New York. A number of reports refer to sporadic appearances of the disease and do not suggest that a serious situation was involved. The disease attained epizootic proportions in Montana, Washington, Kansas and British Columbia. Furthermore, the Montana, New York and British Columbia reports involved an occurrence in winter. The conditions of temperature and humidity are quite similar for the occurrence of the disease in Montana, British Columbia and North Dakota, while abundant moisture probably was not concerned in Kansas.

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The information which has come to our attention from year to year from veterinarians and farmers of the State indicates that the disease is now enzootic. It appears to have prevailed more or less extensively during the last eight years in parts of North Dakota. While most of the deductions outlined in this paper are drawn from conditions in North Dakota, it is believed from available information that many of the statements are likewise applicable to the adjacent parts of South Dakota, Montana, Saskatchewan and Alberta, as well as for North Dakota. Obviously, the frequency of the disease varies from year to year in different localities as well as its seasonal occurrence. Moreover, it is well recognized that most morbidity and mortality statistics of live stock disease can be only estimates.

The disease is seldom encountered in the eastern part of North Dakota and it is likewise probably rare in Minnesota. It seems therefore to be of little significance in the Red River Valley. A little farther west, it occurs frequently in the glacial drift plain, but the northern part of the State and along the Souris River is no doubt seriously involved. The Missouri plateau east and north of the river is likewise a district of high frequency. The land in the hills of the Altamont moraine across much of the State seems to be more often concerned than the flats below. It is likewise serious in the western part of the State.

Reports from some of the men in the field indicate that they have seen but a few affected cattle. Others report having "seen so many outbreaks that I have kept no record," or about a third of the cattle and occurring each year or "probably three out of every ten herds in a large area were infected one year." The number in a herd varies from one or two affected animals to practically the entire herd except a few of the older cattle. Outbreaks of considerable magnitude have been noted in districts where it has never been previously observed and yet the source of the infection can scarcely be determined.

Mortality: European writers estimate the case mortality at from 2 to 20 per cent with a more serious prognosis in the younger cattle. Meyer[15] stated that he had observed coccidiosis in Switzerland where it has always been considered a mild intestinal infection. He asserted that it is not an infection which leads to the death of the animals. Our experience in North Dakota is certainly to the contrary. The symptoms and lesions of the disease in this district agree with those of the European writers but the mortality is higher. Most veterinarians report that from

10 to 50 per cent of the untreated affected young animals die of the disease. The age susceptibility observed in this region is similar to that of most writers. It does not seem to occur in calves which are only a few weeks of age, as noted by Smith and Graybill. The animals are usually at least 4 to 6 months old but calves which are still nursing the cows are sometimes infected.

Seasonal occurrence: The disease rarely occurs during the spring and summer months, although sporadic cases do occur. It is therefore not a problem of any significance until the late fall and early weeks of winter. Outbreaks sometimes appear in October, although few are noted before the last of November and December, when the disease seems to reach its height. Its occurrence decreases with the approach of spring.

The appearance of the disease seems to be synchronous with the advent of more severe winter weather or with one of its sudden changes. That fact is one of the most striking features in the epizoology of the disease. Some observers believe that it is more common during severe winters with early snows than when the weather is milder and more open. The cattle are rarely on pasture although they may range on the frozen fields during part of the day. Snow may or may not cover the ground. It frequently develops shortly after the cattle are changed from pasture, which may be the dry range, to the feeding of hay, corn fodder or other forage in the yard. There is often a severe snow storm about the time the symptons appear but how this devitalizing influence precipitates the disease which presumably has a fairly definite incubation period is so far unexplainable. It is possible that this frequency of occurrence may be the result of lowered vitality or resistance on the part of the cattle resulting from low temperatures and the severe winter weather. If that factor is primarily concerned, the relative infrequency of the disease in eastern North Dakota and Western Minnesota is determined largely if not entirely by the absence of infected feed and soil but an increasing frequency may not be unexpected in the near future and an extension of the infected territory occur.

The surface water in the sloughs and pot-holes is invariably frozen but the cold water available from the wells in tanks may reduce the intake and thereby constitute a possible detrimental physiologic influence. It is difficult indeed accurately to incriminate and correlate such predisposing factors which are often of short duration and effective often immediately preceding the attack with definite incubation periods which have been obtained

in the experimental infections. Moreover, it seems impossible to secure definite consistent positive information which will show the source of the infection.

Physiography: Much of the terrain in the states of North Dakota and Montana and the adjacent Canadian provinces of Alberta and Saskatchewan is included in the Northern Great Plains area. This grassland biota is naturally covered by a more or less dense sod of perennial grasses. This rolling prairie plateau slopes eastward from the Rocky Mountains to the Red River Valley in eastern North Dakota and Manitoba. The glaciated area in the eastern part of this district has imperfect drainage in that there are many lakes, small sloughs and pot-holes. While the moisture of these low places may conceivably enable the oöcysts to sporulate and thereby spread the infection, this feature of the land is less applicable to the western section. Nevertheless, coccidiosis occurs in western North Dakota, Montana and Saskatchewan. This Missouri plateau is supplied with an ample and more ancient drainage system than the glaciated area to the east.

Precipitation: The annual precipitation over practically this entire area is less than twenty inches so that twelve to fifteen inches in many areas is not subnormal. Except for the snowfall, most of the moisture falls in the spring and summer months. Obviously in this latitude during the winter months, the general lack of thawing weather and the prevalence of zero temperatures is not conducive to the prompt sporulation of coccidian oöcysts. Those oöcysts contained in infected feces, when placed outside at the prevailing winter temperatures have failed to show evidence of development until spring. It seems, therefore, that the asexual or exogenous cycle of reproduction outside the host occurs during the spring and summer months. Moreover, there is probably no danger in the spread of the disease from infected animals during the winter months.

Why infestation fails to appear more frequently during the summer and fall, while the cattle are on pasture and the range, with access to the low moist coulees and pot-holes, is certainly a mystery when compared with the observations of European writers. Neither does the high frequency seem to be correlated with wetter years, as reported by Zublin[16] in Switzerland. It is true that cattle are often out during the more open weather, when there is little snow, with access to the same pasture conditions when frozen but then the disease appears. This is not

constant, however, because in many cases hay and forage must be incriminated for the cattle had been in the yards for weeks. Irrigation is little concerned in the area familiar to the writer although Marsh believes that it may be involved in Montana inasmuch as much of the alfalfa hay is grown on low or irrigated fields, while little trouble is encountered with upland or prairie hay.

Pathogenesis: Only a few workers seem to have reproduced the disease so that the number of reported experimental infections with coccidiosis is small. Guillebeau and Hess (noted by Railliet),[2] Montgomery[17] and de Blieck and Douwes[18] found incubation periods of approximately three weeks in experimental infections. Bruce,[12] on the other hand, produced infection in six cattle in about 14 days after feeding infected feces. The writer succeeded in infecting two calves by the feeding of sporulated oöcysts contained in feces from infected animals. The oöcysts appeared in the feces in 12 and 13 days respectively after the infected material was given. Bruce postulates the presence of a new species of coccidium, *E. canadensis*, as the causative agent in the British Columbian outbreaks rather than *Eimeria zurni* of the European writers. The different seasonal occurrence and a shorter incubation period in the territory included in this paper and British Columbia may further support his assumption.

The writer has carefully examined many matured oöcysts but has been unable to distinguish structures differing from the original European descriptions. Each oöcyst, however, contains four sporocysts which are irregularly arranged and each of those contains two sporozoites. Few spherical oöcysts have been noted, so that most of them were oval in shape. Eighty-seven oöcysts were measured from seven different animals which were probably at least six months of age. They varied in size from 13.7 to 19.8 microns in length and from 12.0 to 18.3 microns in width, with an average size of 17.1 by 15.2 microns.

These few reports of successful experimental infections and the writer's difficulties in reproducing the disease, with the probability that the unsuccessful attempts of some workers are not mentioned, suggests that some accessory or predisposing factors are involved in addition to the ingestation of ripened oöcysts. The disease seems to be even more frequent where there is no reason for its appearance so far as a possible source of infection can be determined than the successful experimental infections. Zublin recognized that apparently robust, sound, well-

developed individuals become affected at least as frequently as emaciated, weak animals. Few reports of recurrence on the same farm on successive years have been secured.

The danger of permanently infected land is therefore as yet but a nominal one, although we have little or no definite information to show how long the infection will remain alive under external conditions. Furthermore, the experimental difficulties involved in securing such information are even more real than apparent. While cattle may be carriers, as reported by some workers, the writer has never been able to find oöcysts in the feces of cattle in healthy herds or from those in affected herds which did not present the clinical symptoms of coccidiosis. The frequency of the occurrence of the disease in the Northwest is at least highly suggestive that some accessory or predisposing factors are operative at times in addition to the accessibility of the causative coccidia.

Upland hay of good quality and the entire absence of low wet areas in the pasture are involved, as well as low pastures and slough hay. Crops grown on farm land in cultivation seem involved as well as original prairie sod in pasture and hay land. It is difficult to find a consistent correlation of the casual oöcysts as carried by certain feeds, water supply, types of pasture or topography and drainage of the land, to the occurrence of the disease. If cattle develop the disease while fed on corn fodder, alfalfa, straw, silage, oats, sweet clover, timothy and upland prairie hay while in the yard and watered from the well, it would seem that intelligent successful prevention will be accomplished with dificulty. It looks like a better opportunity for good, intelligent medical treatment and nursing than for immunization procedures as a means of reducing losses from this protozoan disease.

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Minneapolis, the Breadbasket of the World

ABBOTT LABORATORIES PUBLISH NEW PRICE LIST

The Abbott Laboratories, of North Chicago, Ill., are now distributing a new price list. This list is strictly up to date and, from the artistic standpoint, it is really a work of art, designed and printed in attractive colors. The list includes not only the products of the Abbott Laboratories, but those of the Dermatological Research Laboratories and those of the house of John T. Milliken & Co., of St. Louis, which was acquired by the Abbott Laboratories the first of the year. If you have not received a copy of the new price list, be sure and write for one. Address your request to the Abbott Laboratories, North Chicago, Ill.

Minneapolis, the Youngest City of Its Size in the World

One of the delightful shaded walks of the University Farm Campus.

CORRELATION OF THE RAPID AND THE LONG AGGLUTINATION TESTS FOR INFECTIOUS ABORTION OF CATTLE*

By H. F. LIENHARDT *and* CHAS. H. KITSELMAN

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The purpose of this report is to focus attention upon the rapid method of diagnosing Bang's abortion disease and to stimulate the publication of similar work.

Following the method outlined by Huddleson and Carlson,[1] it was thought advisable to correlate the results from routine samples submitted to the Pathology Research Laboratory of the Kansas State Agricultural College, secured by the new or rapid method and by the old, time-honored method, in order to determine the efficiency of the former.

The first few samples were tested using the identical technic described by the above workers. During the early development of proficiency with this method, minor objections were encountered which prompted us to make deviations from the strict technic followed up to that time. Foremost among these minor objections was the smallness of the ruled squares on the glass plate. The authors found a square one and one-half inches by one and one-half inches to be more satisfactory and completely overcame the tendency of the test fluids to overun their squares, especially since a short period of rotary agitation was found to be highly desirable to obtain a quicker and more complete agglutination in positive samples.

The antigen was prepared in accordance with the method outlined by the Michigan workers.

Glass plates of ordinary clear window-glass, nine and one-half inches square, were ruled off for six samples of five dilutions each by means of a diamond marking pencil.

Because of the labor necessary to mix the antigen and the serum completely with a toothpick or match stick, and the feeling of always having an unsatisfactory mixture, a better method was sought. To accomplish this the tip end of a 1-cc pipette was used and the square containing the greatest dilution was mixed first, and so on until the first, or 1-25, dilution square was mixed.

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One sterile pipette was used for each sample run and it was found quite convenient to measure the serum and mix the serum and antigen before laying the pipette down. The mouth of the pipette must be kept tightly covered by the index finger to minimize capillary attraction, and the pipette should be dipped in the antigen before the serum is drawn in to make the mixture. This decreases the danger of carrying serum from one dilution over to another or from one square to another.

After thoroughly mixing, the plate is passed rapidly through the flame of the Bunsen burner, and is warmed slightly above body temperature, that is, slightly warm to the back of the hand. A little experience is necessary to judge the correct temperature and exposure to the flame. The reaction is now timed by means

TABLE I—*Comparison of rapid and long agglutination tests*

NUMBER OF SAMPLES POSITIVE		NUMBER OF SAMPLES NEGATIVE		TOTAL NUMBER OF SAMPLES
RAPID METHOD	LONG METHOD	RAPID METHOD	LONG METHOD	
29	30	30	29	59
		7	7	7
3	3			3
3	4	22	21	25
9	9	33	33	42
19	18	80	81	99
42	40	101	103	143
11	11	52	52	63
8	8	3	3	11
18	18	1	1	19
30	31	99	98	129
172	172	428	396	600

of a five-minute interval timer; any reaction occurring later is disregarded because the effect of evaporation produces spurious readings.

Tabulations of 600 different samples (table I) which were sent in during several months from various sections of the state of Kansas were examined by one of us and with but two exceptions were examined and then retested as a check upon the behavior of the samples. It was impossible to retest these samples because of insufficient serum and the difficulty encountered in obtaining more blood. Since there was no disagreement in the tests that were made, it is unlikely that any error is introduced by including these exceptions among the six.

Huddleson and Carlson report 100 per cent agreement for 2000 bovine sera tested when clumping was complete or incomplete in .04 cc or less of serum.

Our comparisons show a disagreement of approximately 1 per cent or 0.5 per cent for each method. This is so small that for all practical purposes it may be considered of negligible importance. Attention should be drawn to the fact that the rapid method yielded 172 reactors and the long method yielded a like number, showing in this case 100 per cent agreement. The number of negative cases were likewise equal by both methods. In this laboratory the short method has proven to be highly satisfactory and because of the ease with which the test can be performed and the speed with which a diagnosis can be made is to be preferred and will become a permanent diagnostic method in the testing of all routine bovine sera for Bang's abortion disease. In work demanding greater accuracy both methods will be employed.

REFERENCE

[1]Huddleson, I. F., & Carlson, E. R.: A rapid method of performing the agglutination test in the serum diagnosis of Bang's abortion disease in cattle. Jour. A. V. M. A., lxx (1926), n. s. 23 (2), pp. 229-233.

Barn of the Division of Veterinary Medicine, University of Minnesota, where the cattle in connection with experiments on bovine infectious abortion are quartered.

INVESTIGATIONS ON THE TRANSMISSION AND ETIOLOGY OF HOG FLU*

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Introductory

The disease, which has come to be known as "hog flu," first attracted the attention of veterinarians and swine-breeders in the fall of 1918, when the great outbreak of human flu was sweeping over the country, and this fact, coupled with some similarity in the clinical symptoms of the two diseases, served to engraft the term "flu" on this seemingly new swine epizootic. The term "flu," however, is a poor one, as it conveys but little meaning and does not adequately describe the disease. Considering the clinical manifestations of the disease and its usual course, when uncomplicated, the term "infectious bronchitis of swine" would seem to be a better definition of the disease. The disease has also been designated as "broncho-pneumonia of swine," but this term does not seem to be an altogether proper one for reasons which will be given later. Inasmuch as the disease has been fully described in veterinary literature, only a brief description of it will be given here.

Description of the Disease

The onset of hog flu is sudden, an entire herd often coming down within 24 to 48 hours. The clinical symptoms in an uncomplicated case are those of a bronchitis. The most characteristic symptoms, more or less in order of their appearance, are: loss of appetite, disinclination to move, fever, jerky or thumpy respiration, and cough. The affected animals may present a very sick appearance for several days, after which there is usually a marked and rapid improvement, which may be quite as surprising as the sudden onset. In mild, uncomplicated cases, the disease may run its course within a few days to a week. There is, however, practically always a marked gaunting up or loss in weight, which is often out of proportion to the severity of the attack. This loss in weight is not recovered rapidly and constitutes a serious economic loss to the farmer or

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hog-raiser. The mortality in uncomplicated cases is low (from 1 to 3 per cent) and often the entire herd recovers without any loss. In fatal cases, a terminal pneumonia ensues, which is of the lobular type, and this has led to the term "broncho-pneumonia of swine." However, in view of the fact that the great majority of the affected animals recover before the initial bronchitis has developed into pneumonia, the term "broncho-pneumonia" is not a good one for this disease. About the only lesions seen in fatal cases are patches of pneumonia in the lungs, with marked enlargement and congestion of the lymph-glands lying along the trachea.

The disease has a marked seasonal incidence, prevailing mostly in the late fall and early winter, and would seem to result from a lowering of the bodily resistance from cold and exposure.

There appears to be little, if any, immunity following an attack of this disease, since it seems to be quite well established that the same herd may suffer from two or even three attacks of flu in one season.

There is no specific treatment for the disease. However, if the affected animals are given good care and attention and are provided with good sleeping-quarters, free from drafts, good dry bedding free from dust, and are given a light diet, there is usually little loss and frequently the entire herd recovers. Drugs or drug compounds, which are supposed to act as respiratory disinfectants, are usually prescribed by the practicing veterinarian and may or may not be of some value.

PREVIOUS INVESTIGATIONS

Descriptions of the disease have been given by Murray,[1] Dimock and Healy,[2] Kinsley,[3] Dreher,[4] and McBryde.[5] The latter author has also called attention to the rather sharply defined seasonal prevalence of the disease in Iowa. Hasting[6,7] thinks that the disease has a marked influence on the birth-rate in swine, causing sterility in the male and abortion in the female. A review of the literature on hog flu, however, reveals very little work on the etiology of the disease.

Murray[8] isolated and described a small Gram-negative micrococcus, which he thought might be the etiological factor, but later investigations have failed to confirm his findings.

Dorset, McBryde and Niles[9] published a preliminary report of their bacteriological studies of hog flu, in which they reported finding *B. suisepticus* in about 50 per cent of the cases studied

and a non-hemolytic streptococcus from a like proportion of the cases. They were not able, however, to reproduce the disease with pure cultures of the last-mentioned organism.

R. S. Spray[10] made a study of the bronchial flora of 100 apparently normal lungs and 314 pneumonic lungs taken from hogs slaughtered at one of the large Chicago meat-packing establishments. In the normal lungs he found *B. suisepticus* in 4 per cent of the cases studied, while in 12 per cent he found an inulin-fermenting streptococcus, which was pleomorphic and at times showed bacillary forms. In the pneumonic lungs he found *B. suisepticus* in 54 per cent of the cases, while the pleomorphic inulin-fermenting streptococcus was present in 35 per cent. Spray states that the inulin-fermenting streptococcus appeared to possess highly invasive powers in hogs, but was not markedly pathogenic for white mice or rabbits.

Present Investigations

These investigations have included field observations on some thirty-five sick herds in various sections of Iowa, made over a period of seven years, from 1919 to 1926. Material for study (blood, tissues, cultures, etc.) were obtained from many of these herds. In a number of instances, sick animals were obtained, which were brought to the Bureau experiment station at Ames and killed in order to obtain cultures and material for the inoculation of well pigs. In other instances, sick hogs were borrowed from farmers having flu herds and were used for exposure or contact experiments and afterwards, upon recovery, returned to their owners. The noses of the borrowed flu hogs were usually swabbed with sterile cotton swabs and the nasal secretion thus obtained was used for the inoculation of well hogs.

In view of the fact that hog flu and hog cholera are prevalent at the same season of the year and may be associated in the same herd, the endeavor was made in this study to select flu herds which had been previously immunized against hog cholera in order to rule out the possibility of a concomitant infection. Furthermore, in selecting flu herds for observation and experimental study, it was the aim to select herds which were in the early or acute stages of the disease, that is, when the animals were showing the characteristic, thumpy respiration, together with cough and elevation of temperature.

The propagation of the disease experimentally was attempted in the following ways: (1) by injecting well hogs with the blood

of flu hogs, (2) by dropping suspensions of the tracheal and bronchial mucus of flu hogs in the noses of healthy hogs, (3) by dropping suspensions of the nasal secretion of flu hogs in the noses of healthy hogs, (4) by the association of well hogs with flu hogs in the acute stages of the disease, and (5) by dropping cultures recovered from flu hogs in the noses of healthy hogs and the intratracheal injection of healthy hogs with such cultures.

In most of the experiments with hog flu which are described later, shotes which had been previously immunized against hog cholera were used in order to obviate any possibility of cross-infection, as it has been found that shotes which have been immunized against hog cholera are equally as susceptible to hog flu as those which have not been immunized against hog cholera. In the course of these experiments it appeared that shotes weighing around 150 pounds and in good condition were most susceptible to hog flu.

Inoculation Experiments with the Blood of Flu Hogs

Nine shotes, weighing from 45 to 85 pounds each, were given subcutaneous injections of blood (5 to 40 cc) obtained from flu hogs on farms located in different parts of Iowa. The blood samples used for these injections were obtained from nine different herds in which the hogs were suffering from acute flu.

These injections yielded entirely negative results, all of the injected animals remaining perfectly well in spite of the fact that they received relatively large amounts of blood taken from flu hogs.

These results would seem to demonstrate quite conclusively that the causative organism in hog flu does not circulate in the blood-stream.

Inoculation Experiments with the Tracheal and Bronchial Mucus of Flu Hogs

In order to obtain the necessary material for these experiments, flu hogs showing characteristic symptoms were killed in the acute stages of the disease. The trachea was tied off just below the larynx, and the lungs removed entire with the trachea and larynx attached. The esophagus was dissected away from the trachea, which was then seared and slit open with sterile instruments down to the bifurcation of the bronchi. The tracheal mucus, which is usually quite abundant and often blood-tinged, was removed by means of a sterile spatula and

transferred to small, sterile flasks containing glass beads. By compressing the lungs slightly and at the same time raising the posterior lobes upward, additional mucus could often be forced from the larger bronchi into the trachea, and the secretions used in these experiments were usually mixtures of tracheal and bronchial mucus.

Small amounts of sterile salt solution (5 to 10 cc) were added to the flasks containing the mucus and the flasks were shaken vigorously to break up and disintegrate the mucus. The suspensions of mucus thus obtained were then drawn up in sterile pipettes and dropped in the nostrils of well hogs. The material used in these experiments was obtained from thirteen flu herds located in various parts of Iowa.

Twenty shotes, weighing from 50 to 170 pounds, were exposed to hog flu in the manner described, with the result that seventeen (85 per cent) developed the characteristic symptoms of flu. In some of the inoculated animals, there were only slight symptoms of flu, from which the animals soon recovered, while in others well-marked symptoms developed, and in one or two instances the animals succumbed. In a number of these cases, which will be referred to as "experimental flu," the animals were killed after the development of characteristic flu symptoms in order to obtain cultures and the tracheal and bronchial mucus secured from these cases was used, in the manner described above, for the inoculation of other well hogs. In this manner the disease was successfully carried over in some cases through several transfers from animal to animal.

These inoculation experiments with tracheal and bronchial mucus of flu hogs have demonstrated that the disease may be conveyed quite readily by dropping suspensions of these secretions in the nostrils of well hogs. It is quite evident, therefore, that the infectious agent of hog flu is present in the tracheal and bronchial secretions.

In some of our earlier inoculation experiments, more particularly those carried out in 1923, spraying with cold water immediately after treatment was resorted to, with a view to lowering the bodily resistance of the inoculated animal, but in subsequent experiments this was found to be unnecessary.

Inoculation Experiments with the Nasal Secretion of Flu Hogs

In carrying out these experiments, small, sterile cotton swabs, like those used for obtaining diphtheria cultures, were employed.

By means of these, the nostrils (i. e., anterior nares) of flu hogs were swabbed and the nasal secretion thus obtained was suspended in a small quantity of sterile, normal salt solution. The suspension of nasal secretion was then dropped in the noses of well hogs.

Seventeen shotes, ranging in weight from 60 to 185 pounds, were inoculated in the above manner. Eight received nasal secretion obtained from cases of natural flu on farms and nine were inoculated with nasal secretion obtained from cases of experimental flu. Eleven of these animals developed typical flu.

In these experiments the disease was transferred from sick to well hogs in approximately 65 per cent of the cases by means of the nasal secretion dropped in the nose, from which it would appear that the causative agent is frequently present in the nasal secretion of flu hogs.

Inasmuch as hogs are constantly rubbing noses, it would seem that the causative agent or organism might be effectively and quickly transferred from sick hogs to well hogs through the nasal secretion, and the incubation period of hog flu being extremely brief, the disease might thus be very rapidly disseminated through a herd. This might possibly afford an explanation of one of the puzzling features of hog flu, which is the suddenness with which the disease invades a herd and the large number of animals that are affected soon after the disease is first noted.

TRANSMISSION OF THE DISEASE BY CONTACT EXPOSURE

A number of experiments were carried out, in which well shotes were placed in pens with shotes which were suffering from natural or experimental flu.

A total of thirty-two healthy shotes were exposed by contact association in this manner and of this number thirteen, or something over 40 per cent, contracted flu.

These experiments in contact exposure extended over several years, i. e., from 1922 to 1926. When they are grouped by years, there was quite a difference in the proportion of positive results. Thus, in 1922-1923, there were fifteen exposures, with four positive results; in 1924, there were nine exposures, all of which gave positive results; in 1925-1926, there were eight exposures with no positive results.

It has been somewhat difficult to explain this difference in results of the exposure tests, but it would seem that there must be a considerable variation in the virulence of the disease from year to year.

Filtration Experiments with Tracheal and Bronchial Mucus

With a view to determining whether the causative agent in hog flu is in the nature of a filtrable virus, five filtration experiments were carried out with diluted tracheal and bronchial mucus, using small Berkefeld or Mandler filters. In two of these experiments, the mucus was obtained from hogs suffering from natural flu on farms and in the other experiments the mucus was obtained from cases of experimental flu.

In carrying out these experiments, the mucus was transferred to small sterile flasks containing glass beads, diluted with 30 to 40 parts of sterile salt solution and thoroughly shaken to disintegrate the mucus. The diluted mucus was first passed through coarse filter paper to remove the larger particles and then through the bacterial filters. Unfiltered and filtered portions of the diluted mucus were dropped in the noses of well hogs.

In three of these experiments, the hogs which were given the *unfiltered* mucus developed typical flu symptoms, whereas those receiving the *filtered* mucus remained entirely normal. In two of the experiments no symptoms of flu were produced by either the unfiltered or the filtered mucus.

While these experiments are too few in number, perhaps, to be conclusive, they nevertheless point very strongly to the conclusion that the causative organism in hog flu is not in the nature of a filtrable virus.

Bacteriological Investigations

Cultural Studies of Flu Herds on Farms

Since 1919, a bacteriological study has been made of twenty flu herds, located in nine counties, in various sections of Iowa.

Cultures were made from the tracheal and bronchial mucus, the lungs, and bronchial glands of flu hogs on glycerin agar (pH 7.5) and glycerin agar (pH 7.5) to which sterile normal hog serum was added. The growths were transferred to meat-infusion broth and serum broth (pH 7.2) and incubated for 48 hours at 37.5° C. Glycerin-agar and serum-agar plates (pH 7.5) were streaked with the broth cultures and incubated for 48 hours at 37.5° C. Numerous colonies were picked and transferred to meat-infusion broth and serum-broth and incubated for 48 hours at 37.5° C. The cultures which showed growth were examined for motility at 18 to 24 hours and trans-

ferred to glycerin-agar and serum-agar (pH 7.5) for further study.

In considering the bacteriological findings in this study of flu herds, only two types of organisms were isolated with any degree of frequency. A pleomorphic, Gram-positive bacillus, which appeared on glycerin-agar and serum agar plates as minute, transparent colonies, was found in eleven of the twenty herds (55 per cent), while *B. suisepticus* was present in thirteen of the herds (65 per cent). In six of the herds both organisms were found. In two of the herds *B. bronchisepticus* was present and in three herds *B. pyogenes* was found in association with the two organisms first mentioned.

Cultural Studies of Cases of Experimental Hog Flu

In addition to the bacteriological study of twenty flu herds, which has just been described, a similar study was made of twelve cases of experimental flu. These were cases in which typical flu was produced in well hogs by dropping in the nostrils of these hogs the nasal secretion or the tracheal and bronchial mucus of flu hogs. After the development of characteristic symptoms, such as thumpy respiration, fever, and cough, the animals were killed for postmortem examination and culturing. In these twelve cases of experimental flu, the same pleomorphic bacillus, noted in flu herds, was found in six cases (50 per cent), while *B. suisepticus* was present in ten (83 per cent). *B. bronchisepticus* and *B. pyogenes* were each found once, in association with one or the other of the two first-mentioned organisms.

In comparing the bacteriological studies of flu hogs on farms with the studies made of experimental cases of flu, it will be noted that the pleomorphic bacillus was present in about the same proportion of cases, whereas *B. suisepticus* was found in a somewhat higher proportion of the cases of experimental flu.

Cultural Studies of the Bacterial Flora of the Trachea and Lungs of Normal Hogs

In order to make a comparison of the bacterial flora of the trachea and lungs of flu hogs with the corresponding flora of well hogs, an arrangement was made with the officials at a Government-inspected packing company at Des Moines, by which the lungs of normal hogs could be secured.

In examining the lungs taken from hog carcasses handled in the usual manner, it was found, in nearly every instance, that the dirty water of the scalding-vat had entered the trachea

and had often passed downward as far as the bifurcation of the bronchi. This, of course, rendered the specimens unsuitable for the taking of cultures from the trachea and there was also the possibility that the dirty vat-water might have entered and contaminated the lungs. In order to obviate this difficulty, the officials of the packing-plant very kindly handled a limited number of hog carcasses from time to time in the following manner. After sticking and bleeding out, the carcass was dropped on a platform instead of being dropped into the scalding-vat. The carcass was then gradually lowered into the scalding-vat, tail first, and the head was held above the vat-water as the carcass passed through the scalding-vat, so as to prevent the entrance of the vat-water into the trachea. The carcass was then scraped and cleaned in the usual manner.

Before the lungs were removed from the carcass, the trachea was tied, just below the larynx, and the lungs removed with the trachea and larynx attached. All specimens in which the trachea had been cut or even nicked were rejected. In this way specimens were secured which had not been contaminated by the vat-water.

The specimens secured for bacteriological examination were taken from healthy hogs, which had been passed by inspectors of the U. S. Bureau of Animal Industry. Twelve specimens were secured in April, 1925, and seven in August, 1925. The specimens were taken from hogs weighing from 150 to 250 pounds.

Immediately after removal from the carcass, the specimens were placed on ice and taken to the Bureau station at Ames. Cultures were taken from the upper portion of the trachea and from a point near the bifurcation of the bronchi. Cultures also were taken from the lung by first searing the surface of the lung, midway between the posterior tip and the lower end of trachea, and then cutting down with a sterile knife so as to expose the main bronchus, which was scraped and opened. Small, sterile cotton swabs were used in removing the mucus from the trachea and bronchi. The swabs were washed off in 1 or 2 cc of sterile normal salt solution and the resulting suspensions used for the streaking of plates of glycerin agar (pH 7.5) to which filtered, sterile hog serum was added before pouring. Selected colonies were replated and pure cultures isolated for identification. Anaerobic shake cultures were also made in deep tubes of glycerin agar (pH 7.5) which had been

previously boiled to expel air. No strictly anaerobic forms were noted, however.

In a bacteriological study of the tracheal and bronchial flora of nineteen normal hogs slaughtered at a Government-inspected packing-plant, *B. suisepticus* was found in seven (37 per cent) and the organism noted in flu hogs and described as a peomorphic, Gram-positive bacillus was present in five (26 per cent). In addition to these organisms, *B. coli communior* and *Staphylococcus albus* were found as contaminants in several of the specimens examined.

Description of the Organism Designated as a Pleomorphic Gram-positive Bacillus

Morphological and Cultural Characteristics

The organism is a Gram-positive, short plump bacillus, occurring singly, in pairs, and in clumps, when first isolated. After several transfers on glycerin-agar, serum-agar and meat-infusion broth (pH 7.2 and 7.5) the organism appears in a variety of forms, some oval, sometimes in short chains in the form of cocci, and there are numerous diplococcoid forms. It is apparently very pleomorphic and the bacillary forms tend to become smaller. Several attempts to demonstrate capsules have failed. The organism is non-motile and does not form spores.

In meat-infusion broth (pH 7.2) there is delicate, uniform clouding in 24 to 48 hours at 37.5° C., without pellicle formation. After seven days at room temperature, the growth settles to the bottom of the tube in the form of a precipitate and dies, that is to say, it is not possible to obtain growth from the sediment. The growth on glycerin-agar and serum-agar slants (pH 7.5) appears as minute transparent colonies which coalesce in a delicate film over the surface after several days at room temperature. It grows well all along the line of stab in glycerin-agar and serum-agar, without any radiations from the line of puncture. It does not liquefy gelatin nor hardened serum, but produces a small zone of hemolysis around each colony on blood-agar plates in 48 hours at 37.5° C. When first isolated, it fails to grow on meat-infusion agar (pH 7.2 and 7.5) and dies rather quickly on glycerin-agar and serum-agar (pH 7.2 and 7.5), and requires frequent transfers. After numerous transfers, however, the growth remains alive for months in 5 per cent glycerin broth (pH 7.5) containing 0.5 per cent agar, when stored in an ice-box.

Litmus milk is usually coagulated, with a red zone at the top of the tube, in 48 hours at 37.5° C., and the red zone gradually extends downward to the bottom of the tube in two to three weeks. When Russell's double-sugar medium slants are streaked with this organism, a uniform red color is produced throughout the medium.

The organism ferments glucose, lactose, saccharose, inulin, and salicin without producing gas. The addition of these sugars to meat-extract broth seems to inhibit the growth of the organism. However, when a small quantity of sterile beef serum was added, in addition to the sugars, a good growth was obtained.

Agglutination tests were carried out with a serum obtained from a rabbit by injecting the animal intravenously at weekly intervals with graduated doses of a 48-hour broth culture of the pleomorphic bacillus. One week after the fourth injection, an agglutinating serum was obtained which had a titer of 1 to 160 for the bacillus. This serum failed to agglutinate *B. suisepticus* in any dilution.

B. suisepticus agglutinating serum was obtained in the same way, with the exception that the 48-hour broth culture was previously heated in a water-bath for one hour at 60° C., before being injected intravenously. The serum obtained one week after the fourth injection had a titer also of 1 to 160. This serum failed to agglutinate the pleomorphic bacillus in any dilution.

Pathogenicity Tests of Cultures of the Pleomorphic Bacillus and of B. Suisepticus Obtained from Flu Hogs

Five guinea pigs were inoculated subcutaneously with different strains of the pleomorphic bacillus without producing any abnormal symptoms. Two rabbits were injected intravenously with a 48-hour broth cutlture and another rabbit received 48-hour broth cultures, poured in the nostrils, without the production of any abnormal symptoms in any of the animals.

Five guinea pigs, which were inoculated subcutaneously with different strains of *B. suisepticus* obtained from flu hogs, died within 48 to 72 hours. Two rabbits inoculated subcutaneously with a 48-hour broth culture of one of the *B. suisepticus* strains died within 48 hours. Another rabbit which received a broth culture of *B. suisepticus* poured in the nostrils died within 24 hours.

Two rabbits which received mixed cultures of the pleomorphic bacillus and *B. suisepticus*, dropped in the nose, died within 24 hours.

From these tests, it would appear that cultures of the pleomorphic bacillus obtained from flu hogs were non-pathogenic for guinea pigs and rabbits, whereas strains of *B. suisepticus* obtained from the same source were highly virulent for these animals.

Attempts were made to infect well hogs by subcutaneous and intravenous injections of the pleomorphic bacillus and by dropping cultures or culture suspensions in the nostrils of well hogs, but we have been unable, as yet, to reproduce the disease with pure cultures of this bacillus.

SUMMARY AND DISCUSSION OF RESULTS

In the course of these experiments it was shown—it is believed for the first time—that hog flu can be quite readily transferred from sick hogs to well hogs by dropping suspensions of the nasal secretion or the tracheal and bronchial secretions of flu hogs in the nostrils of well hogs. It was shown also that the disease might be transmitted, though not so readily, through the association of well hogs with flu hogs and it would seem probable that when the disease is thus acquired through association or contact that it is transmitted through the nasal secretions. The disease could not be transmitted by means of blood injections and it would appear that hog flu is an affection which is strictly limited to the respiratory tract.

In the course of a study of the bacteria in the respiratory tract of hogs suffering from flu on farms, a pleomorphic, Gram-positive bacillus was found in 55 per cent of the cases studied, while *B. suisepticus* was present in 65 per cent of the cases. In cases of experimental flu, the pleomorphic bacillus was found in 50 per cent of the cases and *B. suisepticus* in 83 per cent. In a study of the bacterial flora of the respiratory tract of normal hogs, the pleomorphic bacillus was found in 26 per cent of the cases studied and *B. suisepticus* in 37 per cent. The two organisms were often found in association. In addition to these organisms, *B. bronchisepticus* and *B. pyogenes* were found in a few cases, but not in a sufficient number of cases to be of any significance.

In comparing the characteristics of our pleomorphic bacillus with the description given by Spray of the inulin-fermenting streptococcus recovered by him from the normal and diseased

lungs of swine, it would appear that these two organisms are probably identical, about the only points of difference being that our organism appears to be a pleomorphic bacillus rather than a streptococcus and seems to produce hemolysis around the colonies on blood-agar plates, whereas Spray describes his inulin-fermenting streptococcus as being non-hemolytic. In referring to the pathogenic properties of his organism, Spray describes it as "not markedly pathogenic for white mice or rabbits" and in this respect it agrees with our pleomorphic bacillus, which is non-pathogenic for rabbits. Spray also describes his organism as having "highly invasive powers in pigs," but cites no experiments to show what he means by this statement. Thus far, we have been unable to produce symptoms of illness in hogs inoculated with pure cultures of our pleomorphic bacillus.

If we combine the cases of natural and experimental flu which were studied culturally by us, it is found that *B. suisepticus* was present in 70 per cent of the cases studied and the pleomorphic bacillus was present in 54 per cent. In Spray's study of the pneumonic lungs of swine, *B. suisepticus* was present in 54 per cent of the cases and the organism described as an inulin-fermenting streptococcus in 35 per cent. If our conjecture be correct and our pleomorphic bacillus is the same as Spray's inulin-fermenting streptococcus, it will be noted that in our study of hog flu the two organisms were present in nearly the same relative proportion as in Spray's study of the pneumonic lungs of swine.

As regards the bacterial flora of normal lungs, however, our results do not correspond so closely with those of Spray. In our study of the tracheal and bronchial flora of normal hogs, *B. suisepticus* was present in 37 per cent of the cases and the pleomorphic bacillus in 26 per cent, whereas Spray found *B. suisepticus* in but 4 per cent of the cases studied and his inulin-fermenting streptococcus in 12 per cent.

In this connection, it is interesting to note that a pleomorphic streptococcus was isolated by two British investigators, David and Robert Thompson,[11] in the course of their studies on the etiology of human influenza. This organism appears to be similar, in some respects, to the one we have encountered in the influenza of swine. The authors just cited do not claim to have discovered the causative organism of human influenza, but point to the sig-

nificance of finding their organism in five cases of influenza and its absence in two normal individuals studied by them.

While we cannot and do not claim that the pleomorphic Gram-positive bacillus found by us is the causative organism of hog flu, we nevertheless wish to call attention to the fact that it was present in over 50 per cent of the cases of hog flu studied by us. It was found also in the respiratory tract of 26 per cent of the normal hogs which were studied. Although we have not as yet been able to demonstrate that this organism is invasive for hogs, it does not seem unreasonable to suppose that it may be one that takes on pathogenic properties when conditions are suitable, as in the case of pneumococcus (type IV) which lives in the throats of 20 per cent of normal, healthy human beings. The latter supposition would seem to be borne out by the presence of our pleomorphic bacillus in the respiratory tract of 26 per cent of the normal hogs which were studied, which corresponds very closely with the percentage of pneumococcus (type IV) in cases of human lobar pneumonia.

The very sudden onset of hog flu and the fact that a large proportion of the animals in a given herd are almost simultaneously affected would seem to point to some organism already present in the respiratory tract as the causative agent, this organism coming into play, that is, taking on pathogenic properties, when the resistance of the animals is lowered by exposure to cold or bodily chilling, as a result of poor housing conditions or from sleeping out in the open in the fall of the year, after the nights become chilly.

While the strains of *B. suisepticus* isolated by us have possessed little, if any, virulence for hogs, except occasionally, when given intravenously, it would seem not unlikely that this organism may take on pathogenic properties under conditions of lowered resistance and in this way be responsible for the terminal pneumonia seen in fatal cases of hog flu. In view of the fact that *B. suisepticus* is generally regarded as the cause of pneumonia in swine and was found by us in quite a large proportion (more than half) of our flu cases, it would seem that it may have an etiological significance in swine flu, at least in the fatal cases of the disease, which are always characterized by pneumonic lesions in the lungs.

CONCLUSIONS

1. Hog flu is an affection of the respiratory tract and the causative organism does not appear to circulate in the blood.

2. The causative organism of hog flu is present quite regularly in the tracheal and bronchial mucus and in the nasal secretion of flu hogs. The disease may be readily conveyed by dropping suspensions of the tracheal and bronchial mucus of flu hogs in the noses of well hogs and also by transferring the nasal secretion of sick hogs to the noses of well hogs.

3. Hog flu may be transmitted by contact exposure from sick hogs to well hogs and when so conveyed is probably transmitted through the nasal secretion.

4. The causative agent of hog flu does not appear to be a filtrable virus and is probably an organism which is present in

TABLE I—*Bacteriological findings in natural outbreaks of hog flu on farms in Iowa*

HERD NAME	COUNTY IN WHICH LOCATED	WHEN VISITED	BACTERIOLOGICAL FINDINGS			
			PLEOMORPHIC, GRAM POSITIVE BACILLUS	*B. suisepticus*	*B. bronchisepticus*	*B. pyogenes*
Sampson	Washington	October, 1919		+		
Olds	do	November, 1919		+		
Schultz	Cherokee	December, 1920	+			
Larsen	Montgomery	January, 1921		+		
Fox	Dallas	February, 1921		+		
Cole	Story	November, 1921	+			
Huntley	do	December, 1921	+	+		
James	Marion	February, 1922	+	+		
Sharts	Palo Alto	October, 1923		+		
Lyford	Story	November, 1923	+	+		
Horning	Washington	November, 1923	+			
Knox	do	November, 1923			+	
Edgar	do	November, 1923	+	+		
Latham	Story	December, 1923	+	+		+
Kingsbury	do	December, 1923	+			
Paetz	Kossuth	November, 1924	+			
Donaldson	Washington	November, 1924			+	
Stewart	do	November, 1924		+		+
Dallas	Dallas	February, 1925	+	+		+
Sloan	Linn	February, 1925		+		

the respiratory tract of hogs under normal conditions and assumes pathogenic properties when the bodily resistance of the animals is lowered.

5. A pleomorphic Gram-positive bacillus was recovered from the respiratory tract in over 50 per cent of the cases of hog flu which were studied bacteriologically and a similar study of the respiratory flora of nineteen normal hogs revealed the same bacillus in 26 per cent of the cases.

6. While the pleomorphic bacillus described in this paper has not been proven to be the causative agent in hog flu, its presence in a large proportion of the flu cases would seem to be of significance, and it is hoped that our bacteriological findings, although not conclusive, will be of interest to other investigators who may contemplate working along similar lines.

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THE DIAGNOSTICIAN IN SMALL-ANIMAL PRACTICE*

By FRANK E. MCCLELLAND, *Buffalo, N. Y.*

This subject, although usually very little thought of, and classed under the theory section of Theory and Practice, is one with unlimited possibilities. The members of a profession so non-specialized as ours must of necessity have more experience and natural ability to stand out in prominence in their work, than the specialists of any science. I shall assume that a diagnostician is more than one who is just able to recognize a disease or pathological change, and shall bring into the discussion an undercurrent of ethics which can and should be used every day in our work. It is not my purpose to preach a sermon, but to give you the facts in plain language as I see them, not so much to tell you anything new but with the idea that it does us all good to "stand at the side of the road and see ourselves go by."

It is needless to say that in our profession, as in any other, success or failure lies in the development of personality, dignity and certain individual characteristics, the chief of which is unlimited patience. While this has always been true it is doubly true now with the change in character of our work and the spirit of the times. It is the backbone of our success in practice.

Given the proper personality and ability, experience will teach us the rest. You all know the adverse impression that the student or beginner in practice makes on the client. That lack of confidence must be overcome by the power of the diagnostician to judge quickly not only the character, temperament and intelligence of the animal, but the owner. Lack of experience has given many of us some hard lessons. I have always felt that those not in constant practice were a little untrue to the profession. Perhaps I have a one-track mind and cannot see it in the broader sense, but from personal contact and examples in other professions I do not believe that the practitioner whose mind is distracted by other lines of work can hope to be very successful as a diagnostician. The role in the drama of the professional man must be continuously and consistently played to be effective.

However, lack of experience does not excuse thoughtlessness, carelessness, lack of patience, or spirit of antagonism. These

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characteristics will result in loss of patient, client and your own self-respect and dignity. The well-balanced diagnostician makes thoughtfulness and carefulness his first assets. There is no reason why we should not use the modern diagnostic methods to the fullest extent. I doubt if there is one of you who does not daily use his microscope for skin or intestinal infestations, or mercurochrome or other fluorescent stains for corneal injuries or ulcers or either operates his own or takes his patients to a specialist in X-ray work. But most of us do not make use of diagnostic laboratories for sectioning of new growths or examination of blood and urine. At this point let me say that it is my opinion our lack of development in this direction is one principal reason why the veterinarian has not been able to command the price for his services in comparison to our sister profession. But the diagnostician's prime virtue is patience. It controls his manner in handling and examining the patient. Most pets, as you know, are not easily managed under rough or hasty handling, which also creates a feeling of hostility in the owner. Patience gives one wisdom in overcoming those tantalizing superstitions and distorted fancies one after another of our clients will use as arguments against our diagnosis. There is no doubt but that patience plus personality influence the thoughts and actions of our clients. Through it we are able to impress, by repetition, on the owner the method of care and treatment and most important of all the nature, possible complications and prognosis or possible outcome of the disease or operation. Which one of us has not had a client come to use from some other veterinarian, with the patient showing a complication of the disease properly treated by the first veterinarian but not completely explained or prognosed? And last but not the least use of patience is to aid us in refraining from making any quick judgments or assuming a snappy or unsympathetic attitude.

In this connection we must not forget the governor of our acts and words—caution. It takes special training to obtain that knowledge and tact which enables one to explain with sufficient definiteness the possible complications to protect himself from a seemingly wrong diagnosis, or to make a good expert witness in the courtroom. We should also be cautious about causing the owner undue alarm. It results in unnecessary worry for the client, which usually reacts against the diagnostician. There is also the danger of the accusation, if not the truth, of

"bleeding the client" or commercializing our science which always lowers our dignity and weakens the confidence of the laity.

To complete fully the development of a diagnostician, I think he must appreciate his relationship and courtesy toward other veterinarians. In our hospital we have the following rules: When a patient comes to us from another veterinarian or hospital, we, in our own minds, are always suspicious of the veractiy of the owner. First, ascertain if possible if all past services are paid for. Second, except it be the same as ours, never discuss diagnosis, care or treatment given by the other veterinarian, as told to us by the owner. Third, never perform an autopsy on an animal which has died under another's care, unless in the presence of the attending veterinarian. Extreme caution and tact must be exercised to protect the other veterinarians as well as yourself.

In consulting, a great amount of good can be done if properly conducted. The actions and attitude of the consultant can either strengthen or destroy the confidence of the owner in the attending veterinarian. In my opinion a discussion of the case should not be within the hearing of the owner. And it seems to me that he who accepts a call from the owner, after consulting with the attending veterinarian, has lost all sense of right or sportsmanship.

If my remarks have bored you or seem commonplace, I hope you will forgive me, for these sentiments and facts are the life and pleasure of my work. If they have in any way sharpened your sense of duty to your patient, your client or your fellow veterinarian, my humble efforts are indeed well repaid.

CHANGES IN THE VETERINARY FACULTY OF THE UNIVERSITY OF HABANA

Dr. Julio San Martin has been appointed professor interino of conformation of animals and veterinary law, to succeed the late Dr. H. Lainé. Dr. Lorenzo Martin Perez, formerly assistant to Dr. San Martin in anatomy, has been appointed interino professor of anatomy. Dr. Miguel Rodriguez, a graduate of the Alfort Veterinary School, has been appointed professor interino of sanitary police and meat inspection and Dr. Bernardo Crespo, Chief of the Veterinary and Animal Industry Section of the Department of Agriculture, has been appointed assistant, interino, to Dr. Rodriguez. Dr. Crespo is editor of *Agricultura y Zootecnia*, the leading agricultural and live stock journal of Cuba.

N. S. M.

BACILLARY WHITE DIARRHEA AND THE AGGLUTINATION TEST*

By J. F. OLNEY *and* OTTO BEDERKE

University of Nebraska, Lincoln, Nebraska

We have in America two diseases of poultry which are of special importance: tuberculosis and bacillary white diarrhea. Since a treatment has not been discovered for these two diseases, we shall have to confine the fight against them to the eradication of the virus carriers. For this purpose, however, we need a good diagnostic method.

In regard to tuberculosis this problem has been successfully solved by the introduction of the tuberculin test. In the case of bacillary white diarrhea, there seems to have been discovered a rather satisfactory method of diagnosis by the introduction of the agglutination test by Jones,[1] in 1913.

As indicated by Hooker,[2] there seems to be a demand for such a diagnostic method. The agglutination test has been used in scientific investigation and in practice in a large part of the United States. The more attention that was given to this disease the more evident it became that it caused large losses by a reduction in fertility, hatchability and viability, and an increase in the mortality during the first three or four weeks of life, a stunting of the surviving chicks, a reduction in the number of eggs laid, and even the death of the adult fowls from acute and chronic forms of the disease.

In several states (Indiana, Connecticut, Maine, Massachusetts, and perhaps others), the agglutination test was adopted at once as a means of eradicating the virus carriers with reported good results.

In the last few years, however, the value of the test as a practical means of diagnosing the disease has been questioned. Some variations have been found by laboratories testing the same specimens of blood, also that repeated tests of the same flock varied to a considerable extent.

Lack of confidence in the agglutination test found full expression when Beach, Halpin and Lampman,[3] of the Wisconsin Experiment Station, in 1926, at the sixty-third annual meeting

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of the American Veterinary Medical Association, declared that the test is not accurate and that they doubted the efficiency of the test as a practical means of eradicating the pullorum infection. Beach and his associates came to this conclusion after an investigation with fifty-six hens which were tested eleven times in thirteen months. The results of this work showed so many variations that most of the birds, they state, could have been considered positive or negative, depending upon the time when the test was made. They also stated that the same samples of blood tested at different laboratories did not agree. From this work they concluded that the poultry industry is better off with no test at all, because of the false sense of security that an inaccurate test implies.

The fact that there are sometimes different results obtained by the agglutination test was well known to the writers. To them the question suggested itself as to how bad these results really are, and if we are justified in depriving the poultry industry of the only weapon of defense against the most deadly infectious disease of baby chicks. That different laboratories obtain different results in testing the same specimens of blood may be a technical fault, which, in the future, may be diminished by a more uniform and finally improved, standard method. The important point to be determined is, whether or not this test, in spite of its many faults, has sufficient value to be recommended to poultrymen for the eradication of the disease, as long as a better method of diagnosis has not yet been discovered. Having the foregoing in mind, the writers were desirous of determining from a considerable number of hens which reacted positively to the agglutination test, the number that could be shown to have the infection by the bacteriological examination of the ovary of each. It was also important to determine the number of infected hens from those which reacted negatively to the test. In making a study of the test to prove or disprove its value, it is also important to observe the results obtained in the field as to the hatchability and viability of the chicks from flocks where the hens reacting to the test have been removed from the flock.

Technic Employed

It may be of interest to describe the technic employed by the writers.

Blood samples: The blood samples were collected from birds which had been fasted for twenty-four hours. The aspiration

method of obtaining the blood, described by Martin and Olney,[4] was used.

Antigen: The antigen used in the test was prepared from *Salmonella pullorum* cultures isolated from baby chicks sick with the disease, and selected for their agglutinability. The strain selected answered all the requirements, morphologically and culturally, producing acid and gas in media containing dextrose and mannitol, and negative in media containing lactose, maltose and sucrose. The antigen was prepared by making a suspension of a 48-hour agar culture in physiological salt solution containing 0.5 per cent phenol, and diluted to a density of tube one of McFarland's nephelometer. Two cc of a 2 per cent solution of sodium hydrate was added to prevent cloudiness.

The test: A serum dilution of 1-50 was used. The tubes were incubated for twenty-four hours at 37° C. before reading.

Interpretation of the test: All reactions complete and incomplete were reported as positive on the ground that the flock is of far greater importance than a few individual birds. In each case the flock was given the benefit of any questionable reactions. All reacting fowls were immediately removed from the flock.

For the purpose of the investigation, two flocks, numbering in all about 3500 birds, were used. Of the 3500 fowls tested, 450,

TABLE I—*Tests and retests of 3500 fowls for bacillary white diarrhea*

(A) Data on fowls tested first time	
Fowls tested	3500
Fowls reacting to the test	450
Per cent reacting	12.8
Fowls examined bacteriologically	209
Fowls from which *S. pullorum* was isolated from ovaries	121
Fowls showing definite lesions of ovaries	125
Fowls showing very small, diseased or normal ovules with inactive ovaries	84
(B) Fowls giving positive reactions on second test	
Fowls tested second time	112
Fowls reacting positive on second test	89
Fowls from which *S. pullorum* was isolated from ovaries	98
Fowls giving negative reactions on second test	23
Fowls from which *S. pullorum* was isolated and which gave negative reactions on second test	9
(C) Fowls giving negative reactions on first test	
Fowls tested second time	75
Fowls from which *S. pullorum* was isolated	3
Fowl reacting positive on second test	1
Fowls showing gross lesions	5

of 12.8 per cent, were found to react to the agglutination test. One hundred twelve of the reacting birds were tested a second time, with the result that 89 reacted and 23 were negative. Fowls were taken from both negative and positive groups for postmortem examination.

As will be seen in table I, 209 birds were taken from those that reacted to the agglutination test for postmortem examination. Of these 121 were found to be positive infection carriers, *S. pullorum* having been isolated from the ovaries.

Of the 88 birds remaining, there is little doubt that a considerable number may also have been infected. The fact that cultures were not obtained may be explained, first, by a number of cases in which the culture was overgrown with spore-forming organisms; second, by the organism having been killed during sterilization of the surface of the ovule, in case of inactive ovaries where the ovules were very small. Another reason why the infecting organism could not be recovered from the ovary of a reacting hen is that the infection was eliminated, or possibly located in some other part of the body.

As will be seen in table I, 112 fowls reacting to the first test were tested a second time. A month later the second test revealed 89 positive reactors and twenty-three negative. However, from nine of the twenty-three, *S. pullorum* was isolated, leaving but fourteen in question.

In general it can be said that the majority of positive-reacting birds were infection carriers, and that the majority of birds reacting to the first test reacted to the second. It is impossible to say that the reacting birds were free from the infection because *S. pullorum* was not isolated. It is also impossible to say that, because a reacting bird fails to react on a second test, the fowl is not infected, because in nine such cases *S. pullorum* was isolated. It appears that infected birds do not at all times carry sufficient agglutinins in the blood to produce agglutination.

Seventy-five birds showing a negative reaction to the first agglutination test were used as controls. On a second test one was found to be a positive reactor, while *S. pullorum* was isolated from three of the seventy-five. Postmortem examination revealed that five birds had gross lesions of the ovaries. From the foregoing it appears that a large percentage of virus carriers react to the test and that repeated tests are necessary.

Some Field Observations

It is very unfortunate, from an experimental viewpoint, that records of the hatchability and viability were not recorded for one or more years before the flocks were tested. It will be of interest, however, to know, in a general way, the condition that existed. One of the flocks which numbered between 1400 and 1500 laying hens was established about six or seven years ago. The owner states that for the first three years there were practically no losses of baby chicks during the first month, which takes the chick past the most dangerous period of its life, as far as bacillary white diarrhea is concerned. The fourth year (1924) in business, the mortality was noticeable and steadily increased each year until it became quite alarming a year ago (1926).

Table II gives a detailed report of 1500 chicks which were hatched after the flock had been tested and all reactors removed. Of the eggs set, 85 per cent hatched throughout the season of 1927. The hatching capacity was 2000 eggs and the incubators were set four times.

Table II—*Record of 1500 chicks, hatched 3-11-27*

Date		S. Pullorum Isolated	Cultures Negative
March 14	3 chicks dead	1	2
March 16	7 chicks dead	4	3
March 18	7 chicks dead	2	5
March 19	6 chicks dead (4 killed)	3	3
March 20	382 chicks sold, leaving 1096		
March 21	1 accidental death		1
March 21	1 chick dead	1	
March 23	1 chick killed, small and unthrifty		1
March 25	1 chick killed, small and unthrifty		1
March 27	1 chick killed, small and unthrifty		1
March 28	2 chicks killed, small and unthrifty		2
March 30	1 chick killed, small and unthrifty		1
March 31	1 chick killed, small and unthrifty		1
April 2	1 chick killed, small and unthrifty		1
	33 chicks dead or killed	11	22

A history of the other flock regarding hatchability and viability was not obtained. During March and April, 1927, the hatchability was about 80 per cent. A mortality record was kept on 2615 chicks placed in eight lots. Cultures were not made from each chick to determine the presence or absence of infection. The mortalities during the first four weeks were 131, or 5 per cent. These results are very favorable and reported by the manage-

ment to be the best obtained for a number of years. The authors do not wish to give the agglutination test credit for all of the improvement, for each year better methods of hatching and brooding chicks are used. The exact amount of benefit derived from the test can be determined only by a series of well-controlled experiments.

Summary

From the postmortem examination of birds giving positive and negative reactions to the macroscopic agglutination test, it appears that a great majority of infection carriers react to the test. That repeated, yearly tests of breeding stock, together with proper sanitation and a vigorous culling of unthrifty chicks, will control the disease is almost beyond question.

The results obtained by the writers agree with the majority of experimental workers, that the chick viability from tested fowls is high.

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HEREDITARY FACTORS IN DISEASE RESISTANCE*

By E. ROBERTS, *Urbana, Illinois*

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Heredity, the process by which an individual passes on to future generations his characters, lies at the basis of all permanent improvement in animals. This all-powerful factor has been in operation in the building up of every great breed and family, being used consciously or unconsciously by the breeder. Not only has it been responsible for the remarkable accomplishments in animal breeding, but also responsible for many unsuccessful attempts in the field of animal production. It is safe to say that when the laws of heredity are fully understood, including the modes of inheritance of the many individual characteristics, or genes, as they are now called, the breeder may proceed directly toward the goal he has in mind, moulding and patterning a type of animal much as a potter fashions from the plastic clay his works of art.

But that time is not yet, for the science of genetics or heredity is young, having been developed for the most part during the last twenty-five years. However, during this relatively short time much that is fundamental has been learned and daily new discoveries are being made, which increase the general fund of knowledge.

The differences found among animals are of two kinds, one environmental and the other genetic. The environmental differences are of no value for permanent improvement because they are not hereditary; but the genetic differences, since they are hereditary, can be bred in or out of a stock, enabling the breeder to produce the type desired.

Here arises the first problem—to determine which of the existing differences are due to heredity and which to environment.

It is logical that the first characters to be studied should have been those easily followed through successive generations, such as those of color and morphology. Illustrative of the simplicity of some of these characters, let us consider the inheritance of black and red color in cattle. If pure black are crossed to red, the offspring are black; but since one parent was red the crossbreeds are not pure. When the second generation is produced both black and red individuals will be found in the ratio of three blacks to

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one red. One-third of the blacks are pure for black and two-thirds are impure and will produce both black and red offspring. When a red calf is dropped by a registered Angus female mated to an Angus bull, the fact that both sire and dam are impure for color is immediately established.

Unfortunately the most valuable characters in our domestic animals are not such simple characters as color, but are for the most part physiological and invisible, thereby surrounding their study with many difficulties. But being convinced that the same fundamental laws govern the inheritance of all characters, the investigator in this field proceeds with some assurance as he attempts to discover the facts concerning these more complex characters.

In this discussion, our interest lies primarily in the possibility of resistance and susceptibility to disease belonging to the class of hereditary characters.

Hereditary Defects

Investigations have shown hemophilia in man, susceptibility to transplantable tumors in mice, scrotal hernia in swine, blindness in cattle (due to a cataractous condition), an epithelial defect in cattle (reported by Dr. F. B. Hadley, of Wisconsin), presence and absence of complement in guinea pigs, hairlessness in rats, and many other defects to be hereditary. All of these characters are probably due to abnormal structure or functioning, and not due to living organisms—not bacterial in origin.

Since diseases resulting from infection are so prevalent and serious in their results, we are interested in the possible existence of hereditary factors contributing to resistance to bacterial infection. With this in mind, the Department of Animal Husbandry began, in 1924, a study of resistance to bacillary white diarrhea in chickens. Several hundred day-old chicks were inoculated with a culture of *Salmonella pullorum*. The few which survived constituted breeding stock for 1925. The survival among their offspring was 49.6 per cent, while among controls the survival was 18.4 per cent. Adding some of the 1925 survivors to the 1924 breeding stock, the tests in 1926 gave 58.2 per cent survival for the selected line and 11.2 per cent for the controls. Similar results were obtained for 1927. The selected stock is composed of two lines, one which has been more or less inbred for twenty-three years and the other not inbred until 1927. In the long-time inbred stock, brother and sister matings had, among

the 1927 offspring, a survival of 76.7 per cent, while in the other line brother-and-sister matings gave a survival of 45.4 per cent. If resistance and susceptibility are hereditary, these results would be expected, since in the long-time inbred line the susceptible individuals would have been eliminated by natural selection operating over the 23-year period, while in the other line, which was first inbred in 1927, the factors for susceptibility were brought to light by the close inbreeding.

In all of the tests the chicks were inoculated with a pure culture of *S. pullorum* by means of a pipette.

From the results of this study involving more than 8,000 individuals one can conclude that heredity is involved in resistance and susceptibility to bacillary white diarrhea. Recently Dr. Manresa, of the University of Wisconsin, reported that he found in rabbits an inherited resistance to infection with the organism of porcine abortion. Also Lambert and Knox, of the Iowa State College, reported work indicating the presence of hereditary factors in fowl typhoid, and Irwin, of the same institution,reported similar results with rats to infection by the Danysz bacillus.

Veterinarians Can Help Geneticists

The positive results of the few investigations upon the inheritance of resistance to disease afford encouragement for undertaking new researches. Pathologists and veterinarians may be of great help in these genetic studies by reporting cases having any possibilities of being influenced by heredity and by giving the geneticist the benefit of their wide experience and training. Only by cooperation can the most be got out of these problems.

In my opinion, ever-increasing attention should be given to the possibility of contributing to the control of disease through the application of heredity in the breeding of animals.

Past procedure in disease control has been largely based upon the assumption that the causes of disease are environmental and that heredity is a negligible or minor factor.

If resistance and susceptibility are hereditary, our present preventive measures in disease control retain the susceptible as well as the resistant individuals. Since the susceptible bear young, the total resistance is being lowered by the retention of individuals which without preventive measures would be eliminated by natural relation. Of course no one would advocate decreasing the energy spent in our present methods of prevention, but should not the possibilities of genetics as a source of aid in controlling the most serious cause of loss in animal production be thoroughly investigated?

SOME OBSERVATIONS REGARDING THE CAT IN HEALTH AND DISEASE

By GERRY B. SCHNELLE, *Boston Mass.*

Angell Memorial Hospital

The following figures, taken from the yearly reports of the Angell Memorial Hospital, show clearly that the cat is an animal worthy of any veterinarian's attention. In the year 1926, 4837 cats were medical or surgical cases, either in the Hospital or the dispensary. Last year there were 2111 hospital cases and 4311 dispensary, or a total of 6422 cats treated, either medically or surgically, during the year 1927. These figures represent quite an investment on the part of the owners. A goodly number of the patients were for major surgical operations.

Without a doubt, the handling of the cat, and diagnosis and treatment of disease is much more difficult than in the dog.

The quickest way to discover whether a person has real "animal sense" or not is to place a frightened, wild-eyed cat in his hands and watch results. If we will but remember at all times that only exceptionally does the cat assume an offensive attitude unless agitated, the handling of such an animal will be much simplified.

Bearing this in mind, in restraining the cat for examination hold it just as gently and loosely as possible and if it struggles do not let your reflexes get the better of you, and tighten your grip—just continue to be as gentle as possible—and the kitty will reward you. Patience, courage, self-control, understanding and love for the animal are the qualities required to get along with the cat and its fond owner.

As we have discovered in the dog, diet plays a part of great importance in the cat hygiene. A varied diet is essential, raw foods are necessary to health and longevity, and the diet is of great importance in treatment of the sick and post-operative patients. Most of us have found to our sorrow that, even following so simple an operation as castration, occasionally one will turn up in four to nine days after operation, vomiting bile and running a temperature up to 104-105° F. and there being no post-operative infection. I will not state that this condition is true infectious enteritis, however closely it may resemble it, but

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I heartily believe that the symptoms are traceable to feeding or at least aggravated by heavy feeding. We have adopted as a routine measure the following instructions:

Feed nothing but milk or broth for three to four days following operations upon your cat. Feed sparingly for the duration of a week.

Since the adoption of this method quite a few months ago, we are no longer troubled with the aforementioned condition.

Before spaying it is well to have the stomach thoroughly empty and ¼ to ½ grain of calomel, twelve hours before operation, is of value. Post-operative care is about the same as after castration, except that the light diet should be kept up for ten days following the operation. No doubt most of you gentlemen who do these operations in the home and turn the patient loose after you are through with it, are not troubled with post-operative care to any extent. I contend that if the patient gets his usual exercise there will be no trouble, but if it does not, it is wise to look to its diet.

Cesarean Section in the Cat

The cesarean operation can be performed with success upon the cat if done soon enough. Salient points about this operation are to operate quickly, give 2 cc of pituitary extract as soon as you have finished the job, get the mother and her kittens home and keep her on milk and broths for a week. At the Angell Memorial Hospital, Dr. Schneider has performed four cesarean sections and a hystero-oöphorectomy upon one cat and she is still alive and enjoying good health without having to worry about more kittens. I have done three cesareans and a hystero-oöphorectomy upon one cat, only to have her die following the latter. All four of these operations were done within a fourteen-months period.

Regarding infectious enteritis, coli-bacillosis, cat typhus or whatever we may call it, as you know, briefly, the history is complete anorexia, vomiting yellow or greenish-hued liquid, and depression to varying degrees. Clinical examination shows pain upon manipulation of the abdomen, temperature from 102-106° F., or subnormal in the last stage, frequent retching, and sometimes bloody diarrhea.

We have reason to believe that infectious enteritis is not very infectious, that only peculiarly susceptible cats will contract the disease when exposed to it. We know that following stormy,

rainy weather, the number of cases is greatly increased. Perhaps this is due to the fact that during such weather most cats are inclined to be listless and not move around much and that the owners feed them as much as ever. I do not know, but I am inclined to believe that this factor is of importance.

Regarding treatment, I think we have tried everything that one might give a cat. Seemingly the best results are obtained from early administration of chlorax. Make up a solution—a dram to an ounce of water—and give two drams of the solution every three hours, continuing for twenty-four hours after vomiting has ceased. In a pinch, zonite may be substituted, using the proportion of two teaspoonsful to a glass of warm water. Do not attempt to force feed unless it be by rectum and offer no food excepting milk or broth for ten days after the onset of the disease.

Abscesses and Other Infections

Other conditions which we are frequently called upon to treat in the cat, and which require treatment varying from the ordinary, are abscesses and infections in the deeper structures of the limbs and tail. Probably more than 90 per cent of these infections are caused by cat bites, in other words, a penetrating puncture wound. If ever there are conditions calling for *free* incision, these require it.

The abscess is best treated by shaving or at least clipping the hair for a reasonable distance from the edge of the affected area. Incise freely, drain and wash with an antiseptic solution as chlorazene. In 24 hours remove all the skin made apparently lifeless by the undermining infection and it is well to remove some of the skin apparently healthy so that there is no possibility of pockets forming between the skin and the underlying structures. Paint with mercurochrome twice daily until healing is affected.

Deep infections, especially those into bone, are best treated by currettage at the beginning and let the wound heal as an open wound with the aid of mercurochrome.

When there is a history of a choking cough, gagging, usually complete abstinence from food (though not always so), be sure to look into the pharynx, even if ether has to be given to do so, for you will often find a needle there, or in that region.

Have you not sometimes seen a cat with chronic eczema and had a history of an apparently correct diet? That is, raw food being fed? Further questioning in such conditions invariably

discloses that a quantity is being fed that would easily do for two or three or even four cats—and still the kitty has a ravenous appetite. The treatment in these cases is obvious.

No discussion of such a rambling nature as this would be complete without a reference to toxicology. Carbolic acid, creosote, tar, common flea soaps, creolin, naphthol and morphin are all taboo as cat medicine. Salol, iodoform and strychnin should be used with great care, in very small doses.

A few rather queer appearing peculiarities of the cat, which, while of no great importance, sometimes help in treating the cats' owners are as follows:

Manx cats are prone to constipation and when they become constipated, are stiff legged and finally become paralyzed behind.

Three-colored cats are almost always females and when they are males they are sterile.

Black cats are more apt to chase their own tails than are white or colored cats. In reference to the latter, which I learned from Dr. Dailey, a woman wrote in to the doctor asking advice about her cat which had the aforementioned habit. In answer, Dr. Dailey replied that she had a black cat and that the condition could not be improved. The good lady was greatly mystified but wholly pleased by the answer, which was correct.

To sum up—know cats and please your clients.

DOCTOR MOHLER AGAIN HONORED

Dr. John Robbins Mohler, chief of the Bureau of Animal Industry of the United States Department of Agriculture, received the honorary degree of Doctor of Science from the University of Maryland, at the commencement exercises held in Baltimore, June 2. In conferring this honor, Dr. Raymond A. Pearson, president of the University of Maryland, referred to Dr. Mohler as having a record of outstanding service for twenty-one years in the U. S. Bureau of Animal Industry and for more than half of that time as and still filling the position of Chief of that Bureau; protector of public health; leader of great scientific forces; recognized at home and abroad because of research and writings; member of many organizations devoted to the promotion of public health and welfare; supporter of the best in community and nation efforts. This is the third occasion of which Dr. Mohler has received the honorary degree of Doctor of Science. In 1920, he was so honored by Iowa State College, and in 1925, by the University of Pennsylvania, his Alma Mater.

THE AGRICULTURAL APPROPRIATION ACT OF 1929

By JOHN R. MOHLER, *Washington, D. C.*

Chief, Bureau of Animal Industry, U. S. Department of Agriculture

The Act making appropriations for the Department of Agriculture for the coming fiscal year, beginning July 1, which was approved by the President on May 16, includes a total appropriation for the Bureau of Animal Industry of $14,385,030. This sum includes a number of increases for promotions and for additional work to be carried on by the Bureau, amounting to $494,965.

Among the increases allowed, there is an item of $199,680 for promotion of veterinarians in the field; this includes an increase of $39,760 which the Senate added to the Bill after it passed the House, as described on page 990 of the April, 1928, issue of the JOURNAL of the A. V. M. A. This additional money will make it possible to promote many deserving employes, especially in the lower grades, who, on account of lack of funds, have not been promoted for several years and are badly in need of increases in salary. An item of $50,000 is provided for investigational work on the cattle grub. This parasite causes losses in the value of hides, in flesh of animals, and in milk-production. The aggregate loss from this pest is tremendous, being estimated at upwards of $55,000,000 per annum. A further increase of $40,000 is made in our appropriation to cover additional investigations on animal parasites in the United States. An increase of $50,000 is provided for extending the meat-inspection service to additional plants, and $10,000 for the inspection of imported animal casings. The sum of $20,000 is included in the increase for investigating the disease anaplasmosis. The sum of $25,000 is included to enable a better and more extended inspection of live stock, while in course of interstate transportation, to determine whether or not the animals are affected with any contagious diseases. Another item provides $4,185 for eradicating scabies in sheep, principally in Louisiana, Mississippi and Kentucky, where there has been a considerable increase in this disease. The sum of $10,200 is provided to continue investigations into the cause of bacillary white diarrhea in poultry and methods for controlling this most destructive disease. The sum of $7,500 is included for turkey-production investigations at the U. S. Range Livestock Experi-

ment Station, located at Miles City, Montana, and $5,000 to conduct experiments in poultry nutrition at Beltsville, Maryland, in cooperation with Johns Hopkins University. Another sum of $5,000 is included for the purpose of increasing the facilities of the Poultry Experiment Station at Glendale, Arizona. The sum of $25,000 is specified to enlarge our abattoir at the Beltsville Farm; also $20,830 for the construction of a beef cattle barn and necessary equipment, including pens, silos, etc. There is also an item of $10,070 for the rebuilding of a bridge at the Iberia (La.) Experiment Station, which was destroyed during the Mississippi flood. An additional sum of $7,500 is included for miscellaneous pathological investigations, which include research work upon various live stock diseases to determine their causes and the best methods of controlling and eradicating them. Likewise $5,000 is added in order to enable a survey to be made of the extent of loco plants in the Southwest, with the view of formulating a definite method of exterminating this weed in order to abate the serious losses which now occur among live stock from eating it.

With the additional appropriations provided by Congress, the Bureau of Animal Industry hopes to accomplish even greater results than have so far been achieved in its endeavor to better live stock conditions and to aid producers in securing larger returns from the sale of their animals and animal products.

BUREAU TRANSFERS

Dr. Wm. A. Montgomery (McK. '18), from Chicago, Ill., to Reno, Nevada, on meat inspection.

Dr. John Dickson (Chi. '10), from Denver, Colo., to Kansas City, Mo., on meat inspection.

Dr. Emerson J. Cary (McGill '94), from Kansas City, Mo., to So. St. Joseph, Mo., on meat inspection.

Dr. Thomas K. Jones (Chi. '18), from Des Moines, Iowa, to St. Paul, Minn., on tuberculosis eradication.

Dr. Clark W. Olson, Jr. (Ont. '22), from St. Paul, Minn., to Bethesda, Md.

Dr. Willard G. Lockwood, Jr. (Corn. '27), from Buffalo, N. Y., to Bethesda, Md.

Dr. James B. Way (K. C. V. C. '14), from Frankfort, Ky., to Louisville, Ky., on meat inspection.

Dr. Joseph R. Addison, Jr., from Chicago, Ill., to Piqua, Ohio, on meat inspection.

Dr. Thomas M. Powell, Jr. (Ind. '24), from Pittsburgh, Pa., to Columbus, Ohio.

Dr. Michael J. Maloney (U. P. '06), from New York, N. Y., to Philadelphia, Pa., on meat inspection.

Dr. Garritt J. Roosink, Jr., from Philadelphia, Pa., to Houston, Texas, on meat inspection.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

RETAINED PLACENTA*

By O. N. SCHULTZ, *Latimer, Iowa*

Before giving this case report, I wish to make a few general statements relative to retained placenta. There probably is not any classification of that condition, because I suppose in case of retained placenta there is always a certain amount of adhesion between the chorionic tufts and the cotyledonary crypts. However, there certainly is a great difference in the degree of this adhesion. In some the tufts can be lifted out readily, and in others they remain in the crypts and will come out only by liquefaction or general sloughing.

We have heard much about the handling of this condition; some advocate irrigation, others condemn it and use a powdered antiseptic. As for myself, I use both. If there is anything to wash out, I irrigate, using one of the hypochlorite solutions. If the uterus is paretic and not necrotic, I think much good comes from irrigation, using quite hot water. It seems to stimulate involution. As to the time to treat a case with retained placenta, I think it all depends on the condition. The sooner the placenta can be removed without causing hemorrhage and irritation, the better.

I generally have my clients report soon after the 24-hour period. If a heavy piece of afterbirth is presented, early intervention can likely be taken. If only a thin, stringy piece is presented, we most likely have an adherent case and the treatment is delayed until about the 48-hour period. These adherent cases, with swollen cotyledons, formerly were "bug-bears" to me. I have attempted removal, but I have always felt that removal caused the animal more harm than good. I have left such cases alone and put into the uterus the various uterine capsules, uterine oils, and iodoform, but always when I returned and examined these cases, there would be such a bad mess of necrosis and putrefaction that it was discouraging. "Bip" has considerable

*Presented at the fortieth annual meeting of the Iowa Veterinary Medical Association, Des Moines, January 17-19, 1928.

merits, but it is objectionable to the dairyman, as it taints the milk for about two weeks.

I have found, however, one line of treatment which has been satisfactory, but possibly I have used it in too limited a number of cases for me to draw conclusions. I wish to report on one case which is representative.

The patient was a pure-bred Brown Swiss cow, with a strong vigorous calf at her side. No earlier history of the cow was obtainable, as she had been "shipped in." The case was seen about twelve hours following calving. The owner was pretty much concerned, as this was a valuable and high-producing cow.

The placenta was found tightly adherent, the cotyledons greatly swollen and attempts at removing the tufts caused hemorrhage and much straining. However, enough was loosened to allow quite a heavy piece of membrane to hang through the cervix. Fifteen carbo medicinalis capsules were inserted into the uterus and distributed as evenly as possible throughout the lumen under the membranes. A dose of mixed infection bacterin was injected. (It has always been an undecided question with me as to whether or not the bacterins have any merit. I have used bacterins in small doses or in divided doses, but I never could point my finger to definite results.)

The owner was advised to protect the animal from cold and I would return in about 48 hours. Upon my return I found the cow a little thinner, but with a fair appetite. The owner said she was getting along all right. In the uterus great changes had taken place. It had involuted considerably and the swelling of the cotyledons was greatly reduced. There were left in the uterus only the umbilical cord and a few tufts of cotyledons, with a little lochia. The remnants in the uterus were washed out with a warm hypochlorite solution and during the siphoning the uterine walls would involute nicely around my hand and arm and felt pliable and soft to the touch. A further dose of mixed infection bacterin was injected and a favorable prognosis given.

This cow is now about due to calve. She conceived readily following retention of the afterbirth and lived up to her reputation of being a high producer. I mentioned earlier in this report that possibly I had treated too few cases to draw definite conclusions. I have treated only five cases, but with identical results, and I am reporting on the method only for what it might be worth.

TUBERCULOUS EPIDIDYMO-ORCHITIS IN A BOAR*

By FRANK P. MATHEWS, *Lafayette, Ind.*

Department of Veterinary Science, Purdue University Agricultural Experiment Station

History: This case occurred in a pure-bred Poland China boar about two and one-half years old. The animal was purchased and satisfactorily used for breeding purposes during the winter of 1926. During the early winter of 1927, seven sows, which were

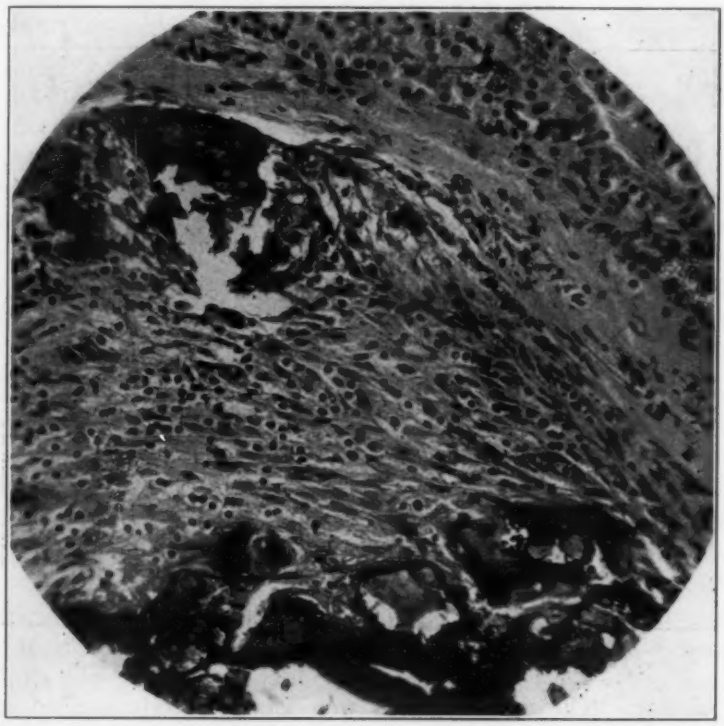


FIG. 1. Photomicrograph of section from boar's testicle, showing the typical granulation and calcification of tuberculosis.

served by this boar, either aborted or failed to conceive. The remainder of the sows in the herd were served by a second boar with no unfavorable results. The seven sows served by the first boar were sold for slaughter and the remainder of the herd tested for infectious abortion. One sow reacted but this individual as

*Presented to the laboratory by Dr. F. W. Graves, of Wolcott, Ind.

well as the rest of the sows have since passed through normal gestation periods. The attending veterinarian castrated the boar in question and presented the testicles to the laboratory for examination.

Gross examination: The testicles were equal in size and showed considerable atrophy. Well-defined lesions were readily observed in the epididymis beneath the tunica vaginalis propria. Less conspicuous lesions were also observed in the testicles beneath the tunica albuginea. Longitudinal sections through the testicles and epididymis disclosed numerous caseo-necrotic areas, which varied from a few millimeters to two or three centimeters in

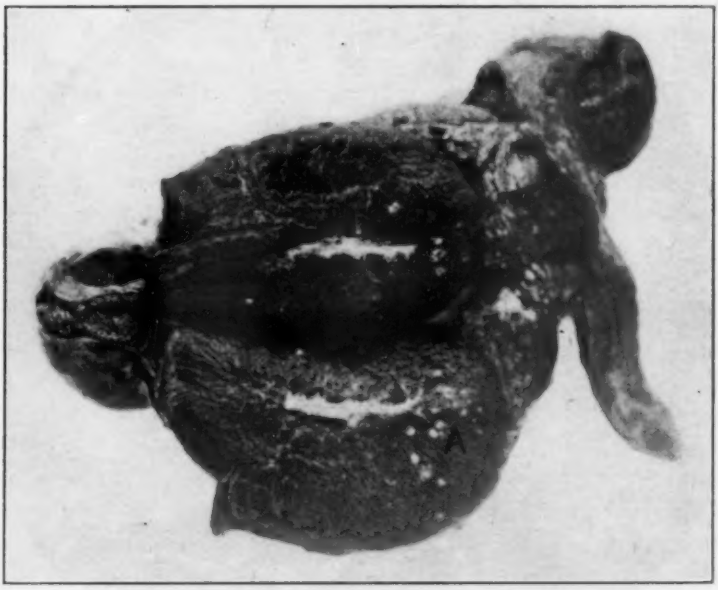


FIG. 2. A testicle and epididymis, showing caseo-necrotic areas (A).

diameter. The necrotic areas were sharply circumscribed and enclosed within a thin but definite fibrous wall. These was some calcification present.

Bacteriological examination: Smears were made from the necrotic areas and stained by Ziehl-Neelson's method, but acid-fast bacteria were not found. Pork-infusion agar, to which blood and serum had been added, was seeded with the necrotic material, but no growth developed for a period of ten days. Guinea pigs were inoculated with the necrotic material, and were killed three months after the inoculation. There were no lesions found upon

autopsy, and the sera of the guinea pigs gave negative results with the agglutination test for infectious abortion.

Microscopic examination: The caseo-necrotic areas were found upon microscopic examination to be surrounded by a zone of endothelioid cells. Many round cells were intermingled with the endothelioid cells. A well-defined capsule surrounded all lesions which exhibited a marked degree of necrosis. Foreign-body giant-cells and calcium deposits were quite abundant. In addition to the older lesions there were many miliary lesions composed of round cells scattered between and around a few endothelioid cells. The miliary lesions showed slight evidence of necrosis and had stimulated but little fibroblastic response. The convoluted seminiferous tubules were much decreased in size and there was no evidence of spermatogenesis. The epithelium of the convoluted tubules was practically destroyed. A few epithelial cells ware still present but were irregularly distributed and showed either pyknosis or karyorrhexis. Sections stained for the presence of acid-fast organisms showed an occasional organism of this type. These organisms had a beaded appearance and were found in the miliary lesions but not in the older lesions in which necrosis had occurred.

Diagnosis: The fact that acid-fast organisms were demonstrated only in the miliary lesions, and that the experimental inoculations were made with material from the old necrotic lesions, suggests the possibility that the guinea pigs did not receive a sufficient dose of the tubercle bacilli to produce the disease. The microscopic changes in both the testicles and epididymis were indistinguishable from those caused by *Mycobacterium tuberculosis*, and since acid-fast organisms were found in the miliary lesions, a diagnosis of tuberculous epididymo-orchitis appeared to be justified in this case.

Minneapolis, the Youngest City of Its Size in the World

A TWO-LEGGED DOG

By S. E. HERSHEY, *Charleston, W. Va.*

I was very much interested in the report of Dr. P. W. Horner, of Elkhart, Ind., concerning his two-legged dog, in *Veterinary Medicine* for April, 1926. The accompanying photograph of another two-legged dog shows that we in West Virginia can do

as well as Indiana in the way of freaks. This is a half-breed bull terrier, the other side being a general Duke's mixture. This fellow is 18 months old and is always ready for a play with another dog. He stands alone and is just real dog. He was one of his mother's third litter, the first and second litters consisting of five and seven normal puppies. The fourth litter, which arrived two months ago, consisted of three normal puppies and

Put down two, carry naught.

two just like the above, a male and a female. They were sired by the same sire. This puppy, at the age of seven months, suffered an attack of meningo-encephalitis (frights disease), so common in our locality the past two years. Since then he has just been real dog as usual and having a good time. The diet consists of table scraps, with some "Fibro ThoroBred" and corn bread for a change, with very little meat.

Minneapolis, the Breadbasket of the World

REVIEWS

FUR-FARMING FOR PROFIT. Frank G. Ashbrook. In charge, Division of Fur Resources, Bureau of Biological Survey, U. S. Department of Agriculture. xxiii + 300 pages, with 127 figures in the text. The MacMillan Co., New York, 1928. Cloth, $4.00.

This book is the latest addition to the Rural Science Series, edited by Dr. L. H. Bailey. It covers the subject of fur-farming in all its details. The author's first-hand experience in this field, with the observations that he has been able to make in all phases of the industry, eminently qualify him to write upon the subject.

The book is divided into ten chapters. These deal with the nature and present status of fur-farming, geographical distribution of the industry, recommendations for the beginner, fox-farming, raising fur animals other than the fox, transportation of live animals, pelting, marketing pelts, hygiene and legal aspects of fur-farming.

One of the shortest chapters in the book is that devoted to hygiene. A trifle over four pages is given to the subject. The section headed, "Treatment of Disease," occupies less than a page. The brief treatment of this subject does not seem to indicate any belief upon the part of the author that the subject is lacking in importance. On the other hand, it appears to have been his opinion that further elaboration of the subject was not indicated in a book of this kind.

The following significant statement is made: "Insuring sanitation and preventing disease are a function for the fur-farmer, but for the treatment of disease the services of a competent veterinarian or specialist should be obtained. The diagnosis of disease and the administration of potent drugs call for special training and experience, and the fur-farmer who undertakes unaided the role of veterinarian is likely to come to grief."

One would be justified in thinking that the author has been favorably impressed by those veterinarians with whom he has come in contact. Veterinarians should cherish and guard zealously such confidence in the profession as this prominent authority shows. His book should be read by every member of the

veterinary profession. It is as interesting and informative as it is stimulating and refreshing.

Minneapolis, the Financial, Wholesaling, Jobbing, Retailing, Manufacturing, Distributing, Educational, Cultural Metropolis of the Northwest

FILTERABLE VIRUSES. Edited by Thomas M. Rivers. ix + 414 pages, with 27 illustrations. Wilkins and Wilkins, Baltimore, 1928. Cloth, $7.50.

Ten discussions of filtrable viruses are presented in this book, each by a recognized authority. A vast amount of work has been done with this interesting group of infectious agents and the collaborating authors have discussed in one volume some of the chief problems confronting investigators in this field of work.

In order, the following phases of the subject are discussed: General aspects of filtrable viruses, filters and filtration, tissue cultures in the study of viruses, intracellular pathology in virus diseases, virus disease of man as exemplified by poliomyelitis, virus diseases of mammals as exemplified by foot-and-mouth disease and vesicular stomatitis, virus diseases of fowls as exemplified by contagious epithelioma (fowl-pox) of chickens and pigeons, virus diseases of insects, and virus diseases of bacteria—bacteriophagy.

The word "filterable" is used throughout the book, on account of wide usage for many years, although the editor acknowledges that "filtrable" is etymologically correct. Exhaustive bibliographies are appended to all chapters. The fact that the bibliography on bacteriophage contains 225 titles will give some indication of the amount of work already done and reported in connection with this interesting phenomenon within the past few years. D'Herelle published his first description in 1917, although Twort (1915) undoubtedly observed the phenomenon several years earlier.

Although every chapter in the book is full of interesting information, in those devoted to foot-and-mouth disease, vesicular stomatitis and contagious epithelioma will be found the strongest appeals to veterinarians.

Minneapolis, the Gateway to the Ten Thousand Lakes Region

ABSTRACT

STUDIES ON THE BLACK TONGUE PREVENTIVE IN YEAST. Joseph Goldberger, G. A. Wheeler, R. D. Lillie and L. M. Rogers. U. S. Public Health Reports, xliii (Mar. 23, 1928), 12, pp. 657-689.

In previous work the authors pointed out the similarity of experimental black tongue of dogs to human pellagra, a view supported by the suggestion of a common etiology indicated by the successful production of black tongue in the dog by feeding pellagra-producing diets. The report of further results of the same study was included in the present paper.

The results obtained following experiments with the diets producing black tongue led to the conclusion that the experimental black tongue of dogs was due to a deficiency in diet and that yeast contained something which was capable of correcting this deficiency.

This black-tongue preventive in yeast was inactivated or destroyed by heat sufficient to char the yeast, but retained its preventive potency in large measure, if not entirely, after being heated in a steam autoclave at 15 pounds pressure for seven and one-half hours. It was absorbed by English fuller's earth from an acidulated aqueous extract of either dried yeast or of yeast first autoclaved at 15 pounds for two and one-half hours. It cannot be identified with any of the older well-recognized dietary essentials and appears to be identical to the thermostable substance in yeast reported by Smith and Hendrick.

The results of this work strengthen the belief that the black-tongue preventive and the pellagra preventive (vitamin P-P) are identical.

S. S.

Minneapolis, the City of Lakes

DOCTOR ROBERTS ON SABBATICAL LEAVE

A letter received from Dr. G. A. Roberts, of Lavras, Minas, Brazil, stated that he and Mrs. Roberts were scheduled to leave Brazil about the middle of June and would go direct to Oregon, Holt County, Missouri, where the parents of Dr. Roberts are planning a family reunion during the month of July. Dr. and Mrs. Roberts are taking their sabbatical year and their friends may address them, while in this country, at Oregon, Mo.

ARMY VETERINARY SERVICE

CHANGES RELATIVE TO VETERINARY OFFICERS

No change in duty status of regular personnel.

Reserve Corps

New Acceptances

Hanneman, Walter H.	Capt.	2619 Everett Ave., Kansas City, Kan.
Reinhardt, Robert R.	Capt.	Lincolnton, N. C.
Speaker, Jesse P.	2nd Lt.	Tallalah, La.

Separations

Andress, Wm. R.	1st Lt.	Died April 19, 1928.
Dill, David M.	2nd Lt.	Failed to accept reappointment.
Mattingly, Irvan C.	2nd Lt.	Failed to accept reappointment.
Meyer, Oliver A.	Capt.	Appointment terminated.
Mitchell, James C.	1st Lt.	Failed to accept reappointment.
Roberts, Henry P.	2nd Lt.	Failed to accept reappointment.
Russell, Fay F.	1st Lt.	Failed to accept reappointment.
Schattenburg, A. E.	2nd Lt.	Failed to accept reappointment.

Promotions

Doherty, Patrick J., to	Capt.	3046 Newton St., Denver, Colo.
Lash, Cleo L., to	Capt.	1837 Hickory St., Oklahoma City, Okla.
Chappell, Robert F., to	1st Lt.	Navasota, Texas
Broad, Fay E., to	1st Lt.	802 N. Michigan, Plymouth, Ind.
Kucher, Paul C., to	Capt.	829 W. Jefferson St., Ft. Wayne, Ind.

Transferred

Stephens, George	Capt.	White River Junction, Vt. Trans. to Aux-Reserve.

Minneapolis, the Gateway to the Ten Thousand Lakes Region

ORDERED TO FORT SNELLING

The following Veterinary Reserve Officers, located in the Seventh Corps Area, have been ordered to Fort Snelling, Minnesota, for summer training, July 2, 1928:

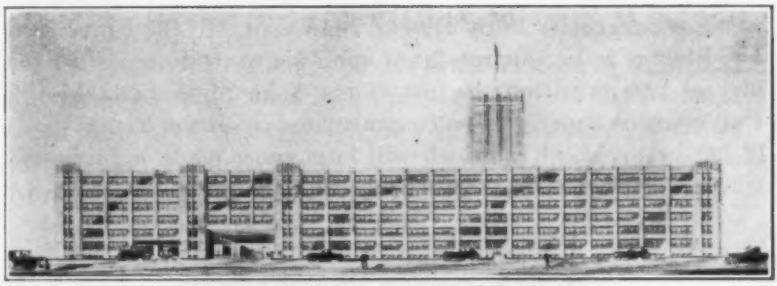
Anthony Joseph Matter	1st Lt.	Crystal, N. Dak.
Edwin Frank Kallenberg	Capt.	Cedar Rapids, Iowa
Ralph Albert Moye	Capt.	Manchester, Iowa
Albert Clyde Barr	Capt.	Kansas City, Mo.
Frank Arthur Bonnstetter	2nd Lt.	St. Paul, Minn.
Clyde Wilton Picht	2nd Lt.	St. Paul, Minn.
Hubert Jesse Harmer	2nd Lt.	Council Bluffs, Iowa
David Harkey Bibens	1st Lt.	Kincaid, Kans.
Godfrey Charles Bevan	Capt.	Washington, Iowa
John Arthur Patton	1st Lt.	Marysville, Kans.
Louis Earl Willey	Capt.	Sioux City, Iowa
Elmer Nelson Davis	1st Lt.	Fort Scott, Kans.
Lester Ray Smith	Lt. Col.	Sioux City, Iowa
LeRoy Emery Dietrich	1st Lt.	Wichita, Kans.
Melvin Leonard Dietrich	1st Lt.	Newton, Kans.

MISCELLANEOUS

NEW BUILDING FOR PARKE, DAVIS & COMPANY

A new building, more than 600 feet long and six stories high, will be added to the Detroit laboratories of Parke, Davis & Company, according to an announcement recently made public.

This structure, shown in the accompanying sketch, which will be devoted to manufacturing, will embody the latest improvements in factory construction and design. It will be of reinforced



New building for Park, Davis and Company

concrete throughout, with every provision made for the health and convenience of the employees. The exterior of the building will be faced with brick to correspond with that of the Administration Building which was completed last year.

The new building will be constructed in three units and it is expected that the first unit will be ready for occupancy on January 1, 1929.

Minneapolis, the City of Lakes

ACADEMIC HONORS FOR DOCTOR BLAIR

Again our profession is called upon to recognize and gratefully acclaim the signal honor which McGill University recently bestowed upon one of her distinguished veterinary graduates, Dr. Wm. Reid Blair, of New York City.

On May 30, at the convocation of that University, the honorary degree of Doctor of Laws was bestowed upon five candidates of international distinction: Dr. Canon Cody, formerly Minister of Education for the Province of Ontario, and chairman of the Board of Governors, University of Toronto; Sir Wilfred T. Gren-

fell, humanitarian of Labrador; George Ilse, literateur and author; Julian C. Smith, vice-president of the Shewanigan Water and Power Company of Canada; and Dr. Wm. Reid Blair, class of 1902, faculty of comparative medicine, whose name was presented to the Chancellor in the following words:

> Dr. Wm. Reid Blair, a distinguished graduate of this University; veterinarian and pathologist; Professor of Comparative Anatomy, New York University; Director of the New York Zoological Park, New York City; Chief Veterinary Officer, 4th Army Corps, American Expeditionary Forces in France; an author, an excellent teacher and in his science a master mind who has devoted his life to the improvement of methods for the humane care and treatment of animals, and the protection and conservation of bird life.

We congratulate both Doctor Blair and McGill University. Dr. Blair is to be congratulated upon his worthily receiving the highest honors within the gift of his Alma Mater, and McGill University is equally to be congratulated upon the happy terms of her bestowal, all of which will meet most ready approbation throughout the entire veterinary world.

F. H. M.

Minneapolis, the Gateway to the Ten Thousand Lakes Region

A NOVEL EXHIBIT

Dr. I. K. Atherton, of Sanitation Boulevard, College Park, Maryland, has kindly supplied the accompanying photograph

Model Hog Farm.

of a novel exhibit, which was arranged for Farmer's Day at the University of Maryland, May 26, 1928.

The exhibit represents a model hog farm. Leading to the farm is a lane, known as "Avenue of Infection." Three wolves are shown in the lane, representing the factors responsible for starting new outbreaks of hog cholera. These are "Infected Pork," "Infected Hogs," and "Abuse of the Double Treatment." A cannon located at the entrance to the hog-yard represents sanitation. It is a typically Athertonesque idea.

DOCTOR YOUNGBERG BOUND FOR U. S.

Dr. Stanton Youngberg, director of the Bureau of Agriculture, Manila, Philippine Islands, accompanied by Mrs. Youngberg, sailed May 3, for Antwerp, Belgium, on the motorship "Tenerifa." They will visit Belgium, Holland, part of Great Britain, and Northern France. August 7, they will sail for Havre from

DR. STANTON YOUNGBERG

Havana, Cuba, and expect to arrive in the United States the last week in August. Communications may be addressed to Dr. Youngberg, while he is in the United States, in care of Mr. E. N. Coberly, Route No. 3, Grove City, Ohio.

COMMENCEMENTS

ALABAMA POLYTECHNIC INSTITUTE

The commencement exercises of the Alabama Polytechnic Institute were held May 22, 1928. In the College of Veterinary Medicine the following graduates received the degree of Doctor of Veterinary Medicine:

N. D. Bradshaw
G. C. Kendall
J. A. Lynn
J. M. Wingate

Minneapolis, the Financial, Wholesaling, Jobbing, Retailing, Manufacturing, Distributing, Educational, Cultural Metropolis of the Northwest

KANSAS STATE AGRICULTURAL COLLEGE

The sixty-fifth annual commencement exercises of the Kansas State Agricultural College were held at Manhattan, May 31, 1928. In the Division of Veterinary Medicine the degree of Doctor of Veterinary Medicine was conferred upon the following:

Robert Stuart Bishop
William Arthur Browne
Robert Ambrose Brunson
Floyd Eugene Carroll
Clait Jennings Doty
Glen LeRoy Dunlap
Daniel Peter Ehlers
Robert Lovell Elsea
George Dewey Huston
Albert Ernest Lauts
Roy Lewis McConnell
John Norris McIllnay
Theodore A. Newlin
Vilo Thoranton Rose
Albert Irving Schmidt
John David Shoeman
Louis H. Smith
Jack Harvey Spurlock

The following graduates received commissions as second lieutenants in the Officers' Reserve Corps of the United States Army:

Floyd Eugene Carroll
Glen LeRoy Dunlap
Daniel Peter Ehlers
Robert Lovell Elsea
Albert Ernest Lauts
John Norris McIllnay
Theodore A. Newlin
Vilo Thoranton Rose
Albert Irving Schmidt
John David Shoeman
Louis Harrison Smith
Jack Harvey Spurlock

Roy Lewis McConnell and Glen LeRoy Dunlap were the honor students in the Division of Veterinary Medicine.

Minneapolis, the Gateway to the Ten Thousand Lakes Region

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS

At the commencement exercises of the Agricultural and Mechanical College of Texas, held June 5, 1928, the degree of Doctor of Veterinary Medicine was conferred upon the following:

H. R. Ellis
T. A. Ward

Minneapolis, by the Waters of Minnetonka

COLORADO AGRICULTURAL COLLEGE

The commencement exercises of the Colorado Agricultural College were held in the college gymnasium, June 7, 1928. The baccalaureate address was given the previous Sunday, by Rev. Martin E. Anderson, D. D., of the Central Presbyterian Church, of Denver. The commencement address was given by Mr. John F. Keating, D. Ed., Superintendent of Schools, Pueblo, Colo.

In the Division of Veterinary Medicine the following graduates received the degree of Doctor of Veterinary Medicine:

Grant A. Ackerman
John W. Childs
Fred J. Christensen
Tom Evans
Frank D. McKenney
David E. Madsen
Lawrence W. Neely
T. Robert Phelps
Fay G. Rankin
Warren E. Rasmussen
Fred E. Reddert
Hilton A. Smith

Dr. Hilton A. Smith, of the Division of Veterinary Medicine, received the scholarship honors out of a senior class of nearly two hundred. Dr. Smith also received a commission as second lieutenant in the Officers' Reserve Corps.

Minneapolis, City of Sky Blue Waters

OHIO STATE UNIVERSITY

The fifty-first annual commencement exercises of the Ohio State University were held in the stadium, Monday evening, June 11, 1928. Of the 1260 degrees granted, thirteen were in veterinary medicine. The annual address was delivered by President Emeritus William Oxley Thompson, D. D., LL. D., who, for nearly twenty-six years, had been president of the University. Approximately 8000 people attended the exercises.

The College of Veterinary Medicine presented the following candidates for the degree of Doctor of Veterinary Medicine:

Charles Henry Bowyer
Carl Eddrie Chase
Edwin Perry Kleeman
Carl Libby Martin

John Leverton Cox
Theodore Clinton Fitzgerald
George Dewey Grossman
Ronald Lester Hectorne
Joseph Ralph Robb
George F. Scheetz
Owen Ellis Thomas
Arvo T. Thompson
Virgil Hester Fondren

Minneapolis, City of Lakes and Gardens

IOWA STATE COLLEGE

The commencement exercises of the Iowa State College, held on June 11, 1928, were preceded by an Honors Day program in which the Division of Veterinary Medicine took an active part.

Walter H. Chivers, a senior veterinary student, was the honor man of the entire institution, as well as having the highest average in the Division of Veterinary Medicine. By virtue of being the best student in the Division of Veterinary Medicine, he received the George Judisch prize, which has a cash value of $25.00 and is sufficient to cover the initiation fee in the American Veterinary Medical Association and dues for three years, including subscription to the JOURNAL He also received a beautiful silver piece as a prize given by the local Alumni Association. Three senior students, Walter H. Chivers, Russell McNellis and Louis Schwarte, together with Dr. H. C. H. Kernkamp, who has been pursuing graduate work in the College, were elected to Phi Kappa Phi, honorary scholastic fraternity.

Dr. H. E. Biester was elected a member of the honorary fraternity Sigma Xi, and, for the first time, the Gamma Sigma Delta, honorary agricultural fraternity, recognized the Division of Veterinary Medicine. It elected Dr. C. H. Stange, Dean of Veterinary Medicine, Walter H. Chivers, Russell McNellis and Louis Schwarte to membership.

The following graduates received the degree of Doctor of Veterinary Medicine:

William Andrews
Kenneth Bullis
Walter Chivers
Clay Collins
Ben Criley
Lloyd Darst
H. Robt. Ellerman
Chris Jorgensen
Russell McNellis
Orley Mayfield
Vernon Overman
John A. Roberts
Forest F. Smith
Louis Schwarte
Dale Glascock

Dr. Walter H. Chivers will remain at the College next year as house surgeon.

Minneapolis, the Metropolis of the Northwest

STATE COLLEGE OF WASHINGTON

The commencement exercises of the State College of Washington were held, June 11, 1928. Seven graduates from the College of Veterinary Medicine received the degrees of Bachelor of Science in Veterinary Medicine and Doctor of Veterinary Medicine:

Charles A. Bottorff
Allan K. Brown
Frank Thomas Harris
Henry R. Hoon
John Shortreed Murray
James A. Porter
John William Wolfenden

Minneapolis, the 1928 Convention City

CORNELL UNIVERSITY

The annual commencement exercises at Cornell University were held, June 18, 1928. The degree of Doctor of Veterinary Medicine was conferred upon the following:

Charles Joseph Goubeaud
John Ernest Greenway
Kenneth Franklin Hilbert
George Henry Hopson
Wayne Arthur Kelly
Myrtle Fober Lee
John Pierce McIntosh
Robert Stuart MacKellar
Lykergus William Messer
Rudolph Edward Nichols
Cyril James Noonan
Charles Jonas Parshall
Philip Poley
William Ernest Ulmer

The following prizes were awarded for the academic year 1927-1928:

The Horace K. White Prizes:

First Prize.....Wayne Arthur Kelly
Second Prize.....Charles J. Parshall

The Hollingworth Honorarium.Wayne Arthur Kelly

The Jane Miller Prizes:

First Prize.....Lemuel W. Woodward
Second Prize.....Samuel A. Johnson

The James Gordon Bennett Prize Lykergus W. Messer

The Anne Besse Prize.....George Henry Hopson

Minneapolis, America's Vacation City

UNIVERSITY OF PENNSYLVANIA

At the commencement exercises of the University of Pennsylvania, held June 20, 1928, the degree of Doctor of Veterinary Medicine was conferred upon the following:

Haim Appelbaum
Alan Bachrach
Russell Sidney Beardslee
John Dengler Beck
Lee McDowell Esh
John Bertram Hagenbuch, Jr.
Maurice Wendell Hale
Charles Edward Hutt
Claude Leroy Lammey
William Edgar Martindale
Joseph Ambler Shoemaker Miller
Claude William Miller
Ernest William Rackley
Warren Baker Rawlings
Taylor Prescott Rowe
John Hubley Schall
Charles Frederick Starke
Clarence Marshall Stevens
Melvin LeRoy Sweigard
Harry Hayward Taylor
Edwin Downing Tuckerman
Joseph Aloysius Mehan

This is the largest class graduated since 1918.

The J. B. Lippincott Prize of $100 for the highest general average for the entire four years of the course was awarded to Maurice W. Hale.

The T. E. Munce Prize of $25 for the highest general average in the courses in Animal Industry was awarded to Maurice W. Hale.

The Jeannette Blair Prize of $50 for the best work in the Small Animal Clinic was awarded to John D. Beck.

Minneapolis, the Gateway to the Ten Thousand Lakes Region

ON THE WAY TO MINNEAPOLIS

Davenport Hotel, Spokane, Wash.

ASSOCIATION MEETINGS

SOUTHEASTERN STATES VETERINARY MEDICAL ASSOCIATION

The twelfth annual meeting of the Southeastern States Veterinary Medical Association was held at the Washington Hotel, Jacksonville, Fla., February 13-14, 1928. The attendance was unusually large, probably influenced by the location of the meeting and the attractiveness of the program, together with the fact that the Florida State Veterinary Medical Association also met for the annual meeting at the same time and place.

Dr. A. G. G. Richardson, of Athens, Ga., presided. The address of welcome was delivered by Hon. John T. Alsop, Jr., mayor of Jacksonville. Mr. Alsop is a very versatile speaker and his welcome to Jacksonville will be remembered for quite a long time by those whose privilege it was to receive it. Dr. W. K. Lewis, state veterinarian of South Carolina, ably made the response to Mayor Alsop's welcoming address.

In his presidential address, Dr. Richardson told the gathering that the public in general is beginning to realize and appreciate the position of the veterinary profession in its relation to the control of diseases of live stock and to the inspection of meat-food products. He recited the activities of the Association during the past year.

Owing to the inability of Dr. Reuben Hilty, president of the American Veterinary Medical Association, to be present, Dr. H. Preston Hoskins, secretary-editor, brought greetings from the national association. He briefly reviewed the expanding activities of the A. V. M. A. and told what was being done by the various officers and committees of the Association to bring about improved conditions generally for all branches of the veterinary profession. Dr. Hoskins stated that it was his opinion that the outlook for the profession was never brighter and that it looked like a very opportune time for the right kind of young men to take up the study of veterinary medicine as their life work. He gave figures to support his belief that the country is threatened with a shortage of graduate veterinarians unless the enrollment in our veterinary colleges shows a marked increase during the next few years.

The program was divided into seven lecture and questionnaire periods, each one in charge of a competent leader. Dr. F. W. Morgan, of Chattanooga, Tenn., was in charge of "Horse Practice." Before getting very deeply into his subject, Dr. Morgan made a few remarks to emphasize the importance of practicing veterinarians affiliating with all local civic activities. During this period, Dr. C. R. Jolly, of Atlanta, Ga., brought up the discussion of the condition among horses that has existed in some of the stockyards in the southeastern states for some time past. This condition is found among horses that have been shipped some distance on the railroads. Discussion of the disease brought out the fact that it undoubtedly was the same pathological condition reported upon by Dr. Robert Graham and several associates, about ten years ago, having been designated a peracute disease of horses and mules, for want of a specific name, at that time. It was believed that the disease was in some way caused by members of the paratyphoid-enteritidis group of organisms. A very interesting discussion followed.

Dr. W. A. Barnett, of Greenwood, S. C., was in charge of the lecture and questionnaire period on "Cattle Practice." The two diseases which received the most attention during this period were anaplasmosis and botulism. Dr. A. D. Knowles, of Kelsey City, Fla., explained at considerable length his findings in connection with anaplasmosis of cattle on several Florida ranches.

Dr. J. L. Ruble, of Quitman, Ga., was in charge of the period devoted to "Swine Practice." Dr. E. M. Nighbert, of the U. S. Bureau of Animal Industry, explained the work which is being done in the field of swine sanitation, with particular reference to the control of roundworms and kidney worms in swine. Dr. U. G. Houck presented a new moving-picture film from the Department of Agriculture, entitled, "This Little Pig Went to Market." Dr. Houck also read a very interesting paper covering the most important diseases of swine, with particular reference to hog cholera and serum-virus immunization.

Dr. W. M. Bell, of Nashville, Tenn., very ably handled the period devoted to "Small Animal Practice" in place of Dr. M. Jacob, of Knoxville, Tenn., who was unable to be present. The lecture and questionnaire period devoted to the "Diseases of Poultry" was handled by Dr. A. L. Shealy, of Gainesville, Fla.

The evening of the first day, a banquet was served in the main dining-room of the hotel, at which Dr. J. V. Knapp, of Tallahassee. acted as toastmaster.

The afternoon of the second day was given over to the "State Veterinarians" with Dr. Wm. Moore, of North Carolina, in the chair. At this session plans were discussed for the formation of an organization to be known as the Southeastern States Live Stock Sanitary Association. Dr. W. K. Lewis explained the proposal.

Chattanooga was selected as the meeting place for the 1929 meeting. The election of officers resulted as follows: President, Dr. J. V. Knapp, Tallahassee, Fla.; first vice-president, Dr. F. E. Kitchen, Greenville, S. C.; second vice-president, Dr. W. B. Lincoln, Nashville, Tenn.; third vice-president, Dr. C. R. Jolly, Atlanta, Ga.; secretary-treasurer, Dr. John I. Handley, Atlanta, Ga.

Among the veterinarians present who had traveled considerable distances to attend the meeting were: Dr. John R. Mohler, chief of the Bureau of Animal Industry, Washington, D. C.; Dr. H. J. Shore, laboratory director, Fort Dodge Serum Company, Fort Dodge, Iowa; Dr. W. M. MacKellar, chief of the Tick Eradication Division, Bureau of Animal Industry, and Dr. J. F. Devine, of Goshen, N. Y.

Minneapolis, City of Lakes and Gardens

NORTHWESTERN OHIO VETERINARY MEDICAL ASSOCIATION

The twentieth annual meeting of the Northwestern Ohio Veterinary Medical Association was held at the Hotel Secor, Toledo, February 29, 1928. More than one hundred veterinarians were in attendance, including a number from Pennsylvania, Michigan and Indiana.

The first paper on the program was presented by Dr. Alvin Broerman, of Reynoldsburg, entitled, "Recent Observations in Pullorin Testing." Dr. John W. Jackman, of Columbus, presented "Canine Practice." Dr. D. M. Swinehart, of Columbus, president of the Ohio State Veterinary Medical Association, spoke on a number of the more important conditions having to to with the welfare of the veterinary profession. Dr. H. K. Wright, Chief Veterinarian, H. K. Mulford Company, Philadelphia, Pa., presented a very interesting discussion of "Johne's Disease." This was illustrated with lantern-slides and a very interesting discussion followed. In the absence of Dr. F. A.

Zimmer, of Columbus, state veterinarian of Ohio, Dr. H. W. Feldwish read a paper that had been prepared by Dr. Zimmer, entitled, "Veterinary Service and the Various Agencies Restricting Such Service." Dr. Reuben Hilty, of Toledo, president of the American Veterinary Medical Association, delivered a short address dealing with some of the more important activities of the national organization. The concluding number on the program was a question-box, conducted by Dr. J. H. Lenfestey, of Lyons.

Minneapolis, City of Sky Blue Waters

ILLINOIS-MISSOURI VETERINARY ASSOCIATION

The annual meeting of the Illinois-Missouri Veterinary Association was held at Edwardsville, Ill., March 22, 1928.

Dr. William Robinson, superintendent of the Department of Animal Industry, Springfield, Ill., addressed the meeting on the subject of "Animal Diseases Transmitted to Man." "Small Animal Practice" was presented by Dr. H. R. Schwarze, of East St. Louis, Ill. Dr. S. W. Haigler, of St. Louis, Mo., spoke on "Sterility," and Dr. H. Schlesinger, of New Athens, Ill., spoke on "Tuberculin Testing in Poultry." This subject was also discussed by Dr. A. A. Moore, of Edwardsville and Dr. Wm. R. Michael, of Highland, Ill.

An election of officers resulted as follows: President, Dr. Walter Hoehner, Belleville, Ill.; secretary, Dr. J. T. Brown, Belleville, Ill.; treasurer, Dr. F. Beckman, East St. Louis, Ill.; Board of Censors, Dr. J. T. Jennemann, St. Louis, Mo., and Dr. H. Kyle, Highland, Ill.

Minneapolis, the Gateway to the Ten Thousand Lakes Region

EAST TENNESSEE VETERINARY MEDICAL ASSOCIATION

Dr. J. F. Kagey, of Kingsport, Tenn., entertained the East Tennessee Veterinary Medical Association at his office, April 14, 1928. Following the business meeting at the office, the party was entertained at dinner at the home of Dr. Kagey. Covers were laid for fifteen. Mr. Frank L. Cloud, City Manager, was a guest of the Association.

MICHIGAN-OHIO VETERINARY MEDICAL ASSOCIATION

The annual meeting of the Michigan-Ohio Veterinary Medical Association was held at the Court House, Adrian, Mich., April 26, 1928.

The program was in the form of a question-box, divided into four sections. Dr. Reuben Hilty, of Toledo, Ohio, conducted the Section on Small Animals. Drs. H. J. Seaman, of Wauseon, Ohio, and A. H. DeGroot, of Dundee, Mich., handled poultry. Drs. E. T. Hallman, of Michigan State College, and E. B. Cavell, of Northville, Mich.,were assigned all questions on cattle. Drs. W. J. Madell, of Jackson, Mich., and A. J. Kline, of Wauseon, Ohio, handled swine.

The election of officers resulted as follows: President, Dr. George D. Gibson, Adrian; vice-president, Dr. John W. Timms, Hudson; secretary, Dr. Lynn C. Palmer, Brooklyn.

Minneapolis, the Metropolis of the Northwest

HUDSON VALLEY VETERINARY MEDICAL SOCIETY

The regular quarterly meeting of the Hudson Valley Veterinary Medical Society was held at Catskill, N. Y., May 9, 1928.

After a fine luncheon at Hotel Saulpaugh, attended by over thirty members of the Society, accompanied in many instances by their wives and guests, the meeting convened at the well-equipped hospital of Dr. L. L. Parker.

After a short business session, Dr. E. L. Brunett, of New York State Veterinary College, Cornell University, was introduced as the speaker of the day. He outlined the general symptoms and methods of diagnosis of several important diseases of poultry, including bacillary white diarrhea, coccidiosis and tuberculosis. Methods of injecting tuberculin and drawing blood samples were demonstrated on living birds. The agglutination test was explained and the reading of results was illustrated by specimen tests from Dr. Parker's laboratory. Many questions were asked relative to the diseases discussed and various methods of treatment and control were described.

A considerable number of specimens, both live and dead birds, were presented for examination. Numerous autopsies were held by Dr. Brunett and quite a variety of interesting conditions were shown. Intestinal parasites, including tapeworms

and roundworms, were the principal troubles disclosed. In several instances, microscopic examinations were necessary to determine the specific causes for the conditions found. While the meeting was devoted entirely to poultry problems, the interest manifested by those present indicated that veterinarians are deeply concerned in the welfare of the poultry industry.

J. G. WILLS, *Secretary.*

Minneapolis, the Breadbasket of the World

KANSAS CITY ASSOCIATION OF VETERINARIANS

The regular monthly meeting of the Kansas City Association of Veterinarians was held Wednesday evening, May 16, 1928, at the Hotel Baltimore. About thirty veterinarians were in attendance. The subject of castration was discussed in its various phases. Dr. R. R. Dysktra, dean of the Division of Veterinary Medicine, Kansas State Agricultural College, gave a most interesting talk on the castration of large animals and Dr. J. C. Flynn, of Kansas City, discussed the castration of small animals.

Minneapolis, the City of Lakes

SOUTHWESTERN MICHIGAN VETERINARY MEDICAL ASSOCIATION

The semi-annual meeting of the Southwestern Michigan Veterinary Medical Association was held at the Columbia Hotel, Kalamazoo, May 17, 1928. Dr. L. B. Sholl, of Michigan State College, discussed "Milk Fever and Pathology of the Udder." Mr. J. P. Torrey, also of Michigan State College, discussed "Bacteriology of the Udder." Dr. B. J. Killham, of Lansing, State Veterinarian, covered the rabies situation at considerable length. The meeting wound up with a dinner. Arrangements were in charge of Drs. E. C. Goodrich, of Kalamazoo, L. A. Ruff, of Marshall, and John A. Schaefer, of Bangor.

Minneapolis, the Youngest City of Its Size in the World

SOUTHWESTERN MISSOURI VETERINARY MEDICAL ASSOCIATION

The spring meeting of the Southwestern Missouri Veterinary Medical Association was held at Monett, Mo., May 23, 1928.

The meeting was held at the beautiful club house in the city park. About twenty-five veterinarians were in attendance. Many of them brought their wives, who were entertained by the local ladies. A most interesting program was carried out.

The principal topics discussed were abortion and mastitis in cattle and various diseases of swine.

Monett is the strawberry capitol of southwestern Missouri and a fine dinner was served by the ladies of the First Baptist Church, featuring this fruit. The president of the local Rotary Club made a splendid address. Plans were completed for entertaining the Missouri State Veterinary Medical Association at Carthage, the last week in June.

An election of officers resulted as follows: President, Dr. H. J. McCarthy, Joplin; secretary, Dr. B. M. Troxel, Mt. Vernon.

Minneapolis, the Financial, Wholesaling, Jobbing, Retailing, Manufacturing, Distributing, Educational, Cultural Metropolis of the Northwest

CONESTOGA VETERINARY CLUB

The regular monthly meeting and the fifteenth annual shad supper of the Conestoga Veterinary Club was held at the Stock Yards Inn, Lancaster, Pa., May 24, 1928.

Dr. M. F. Barnes, director of the laboratory of the Pennsylvania Bureau of Animal Industry, Harrisburg, presented a paper, entitled, "Bang Bacillus Disease." This was discussed by Dr. G. A. Dick, supervisor of Veterinary Extension, University of Pennsylvania, who related his observations of the disease over a considerable period.

Dr. H. B. Mitchell, city milk inspector of Lancaster, acted as toastmaster at the shad supper, which was served at 6:30. Mayor F. C. Musser, who is president of the Lancaster Live Stock Exchange, was the first speaker. He scored milk companies which do not encourage tuberculin testing. He promised drastic action to enforce milk ordinances and emphasized the ever-growing friendliness and cooperation between live stock owners and the veterinary profession. Others who were called upon to make addresses included the following: Dr. C. J. Marshall, University of Pennsylvania; Dr. A. D. McEwen, Research Institute of the Royal Veterinary College, London, England; Dr. T. E. Munce, director of the Pennsylvania Bureau of Animal

Industry; Dr. J. B. Reidy, B. A. I. Inspector-in-Charge of Tuberculosis Eradication in Pennsylvania; Dr. Vincent C. Moyer, Supplee-Wills-Jones Company, Philadelphia; Dr. Robert O. Rothermel, of Reading, Pa., president of the Schuykill Valley Veterinary Club and Dr. U. S. G. Bieber, mayor of Kutztown, Pa.

The meeting adjourned with the understanding that there would be a joint meeting of the Conestoga Veterinary Club with the Schuylkill Valley Veterinary Club and the Cumberland Valley Veterinary Club at the State Laboratory, Harrisburg, on June 21, the invitation having been extended by Dr. T. E. Munce.

HENRY S. WEBER, *Secretary.*

Minneapolis, by the Waters of Minnetonka

NORTHEASTERN ILLINOIS VETERINARY MEDICAL ASSOCIATION

The veterinarians of Boone, Lake, McHenry, Cook and Walworth counties (Ill.) met in Woodstock, Ill., May 25, and organized the Northeastern Illinois Veterinary Medical Association. Officers were elected as follows: President, Dr. H. P. Zimmerman, Woodstock; vice-president, Dr. J. L. Redding, Waukegan; secretary, Dr. H. Paul Gray, Woodstock. It is planned to hold meetings at regular intervals.

Minneapolis, the Land of Hiawatha

MIAMI VALLEY VETERINARY ASSOCIATION

A meeting of the Miami Valley Veterinary Association was held at the Hotel Bancroft, Springfield, Ohio, June 6, 1928. Fourteen veterinarians from Franklin, Montgomery, Clark, Miami and Greene counties were in attendance. Dr. F. A. Zimmer, of Columbus, Ohio, State Veterinarian, delivered the principal address and urged strict cooperation between local veterinarians and the state regulatory authorities, as the best means of eradicating diseases of live stock. Dr. Zimmer stated that the veterinary profession in Ohio was directly responsible for the health and welfare of live stock and poultry valued at approximately $225,000,000. Following the business session, the members of the Association and their wives were entertained at dinner. Drs. Bruce Runyan and P. A. Dillahunt, of Springfield, looked after the arrangements for the meeting. The local newspapers gave some splendid publicity to the meeting.

OKLAHOMA STATE VETERINARY MEDICAL ASSOCIATION

The fourteenth semi-annual meeting of the Oklahoma State Veterinary Medical Association was held at Stillwater, June 11-12, 1928. The sessions were held in the Biology Building of the Oklahoma A. & M. College. Dr. George Pugh, of Lawton, presided. Owing to the absence of Dr. C. H. McElroy, acting president of the College, Professor C. T. Dowell, dean of agriculture, delivered the address of welcome. Dr. C. C. Hisel, State Veterinarian, made the response.

Following the reading of the minutes of the annual meeting, Dr. Hisel made the report on the publication of the proceedings of the Tuberculosis Eradication Conference, held in Oklahoma City, in February. He suggested that uniform rules and regulations for the interstate movement of poultry be adopted. On motion duly made and seconded, a committee was appointed to draft regulations and report later in the meeting.

Dr. C. H. Kitselman, of Kansas State Agricultural College, gave a very able lecture on the agglutination test. Later, he demonstrated the test in the laboratory and each veterinarian present was shown how to start a test.

Dinner was served at the College cafeteria at 6:15. After a very enjoyable meal, Dr. Hisel acted as toastmaster and called upon each member for a short talk. After dinner, all retired to the College Auditorium for a Lyceum number.

Professor R. O. Whittenton, of the Zoology Department of the College, gave a lecture on the classification and life cycles of the parasites of domestic animals. Following the lecture, the members went to the laboratory and were permitted to examine some of the more common parasites under the microscope.

Dr. H. W. Orr, of Stillwater, gave a talk on the laboratory diagnosis of parasitic diseases and later demonstrated methods in the laboratory.

Dr. Pugh discussed the advisability of raising the dues of the Association. This question was referred to the Resolutions Committee, which body canvassed those present and found opinion to favor raising the annual dues from $2.00 to $5.00. A resolution recommending this action will be presented to the Association at the next annual meeting.

Dr. Hisel suggested the advisability of the Association having a booth at the National Poultry Show, to be held at Ardmore.

After considerable discussion, a committee was appointed to look into the matter. A motion prevailed to assess each member of the Association $2.00 to help defray the expenses of maintaining a booth at the National Poultry Show.

Dr. C. R. Walter, of Tulsa, read a very interesting paper on common parasites in dogs and cats, symptoms, diagnosis and treatment. This was followed with a paper by Dr. O. E. Robinson, of Bixby, covering the parasites of swine. This was illustrated with lantern-slides. Dr. Orr then read a paper on parasites of poultry.

Lack of time prevented the presentation of several other papers, which were scheduled on the program.

FRANK R. KNOTTS, *Secretary.*

Minneapolis, Where Guest is King

MINNESOTA'S OLD-TIMERS

Minnesota has thirteen veterinarians who have been members of the A. V. M. A. continuously for twenty years or longer. Dr. M. H. Reynolds, of St. Paul, is the oldest member, with 37 years to his credit. Dr. C. E. Cotton, of Minneapolis, comes next with an even 30. Dr. J. N. Gould, of Worthington, is one year behind, with 29. Drs. T. Lambrechts, of Montevideo, and D. M. McDonald, of St. Paul, have 26-year records.

Dr. J. Butters, of Renville, is at the quarter-century mark. Drs. M. S. Whitcomb, of St. Paul, and C. B. Estey, of St. Cloud, have 24 and 21 years, respectively, to their credit. Drs. Wm. A. Anderson, of Sleepy Eye, J. P. Foster, of Minneapolis, C. A. Nelson, of Brainerd, Wm. C. Prouse, of Minneapolis, and O. C. Selby, of Mankato, reached the 20-year mark this year.

With one exception, these men have been in Minnesota for the entire period mentioned in each case, and eleven are at the same location now as when they joined the A. V. M. A.

A suggestion: These thirteen members should get together at Minneapolis and have a group picture taken, representing an aggregate of 318 years of membership in the A. V. M. A.

Minneapolis, the Financial, Wholesaling, Jobbing, Retailing, Manufacturing, Distributing, Educational, Cultural Metropolis of the Northwest

NECROLOGY

SAMUEL H. BURNETT

Dr. Samuel H. Burnett died at Ithaca, N. Y., April 30, 1928. He had been confined to his bed for several years, as a result of tuberculous infection and the sequelae of a typhoid infection of many years standing.

Born at Webster, New York, November 18, 1869, Dr. Burnett was graduated from the New York State Veterinary College at Cornell University in 1902. He received the degrees of A. B. and M. S. from the same institution. Dr. Burnett taught for several years as a member of the faculty of his Alma Mater. His work was in the field of pathology and bacteriology. Dr. Burnett was the author of "Clinical Pathology of the Blood of Animals," as well as of numerous papers of a research character based upon his work in his particular field.

Dr. Burnett joined the A. V. M. A. in 1905. He is survived by his widow and one daughter. Funeral services and burial were at Webster, N. Y.

WILLIAM D. NOTTINGHAM

Dr. William D. ("Dick") Nottingham, of Fowlerton, Indiana, died May 2, 1928, at the age of 56. He was a graduate of the Indiana Veterinary College, class of 1911, and was engaged in private practice.

ROBERT W. McCULLY

Dr. Robert W. McCully, of New York City, died at Roosevelt Hospital, May 7, 1928. Although handicapped by diabetes for the past few years, Dr. McCully had applied himself incessantly to his work and finally a series of catastrophes, in rather rapid succession, terminated his unusually active career. His wife's sudden demise on Christmas Eve, a railroad wreck, while he was en route to Hot Springs, Ark., the first week in February, and an emergency operation, necessitated by injuries received in the wreck, performed the last week in March, ushered in diabetic coma on May 1 and the passing six days later of a man who probably had the most remunerative specifically equine practice on the North American Continent.

Born in St. Thomas, Ontario, December 16, 1869, Dr. McCully received his veterinary education at the Ontario Veterinary College. He was graduated in 1890. He came to the United States about 1895. After a short stay in Detroit, Mich., he went east and located in New York City. He soon became associated with the late Dr. Ralph Hall on 24th Street. Shortly after locating in New York City, Dr. McCully was employed by Fiss, Doerr & Carroll, as veterinarian to their large sales barn. Later the firm requested Dr. McCully to give them all of his time and to relinquish all other practice. This he declined to do. Then Dr. McCully started to build up a clientele among owners of race horses and other wealthy horsemen that resulted in one of the most lucrative veterinary practices that the world has ever known. Having a cordial, genial personality and being a tireless worker, Dr. McCully soon forged to the front and upon the death of his preceptor, in 1904, he became the moving spirit in an established practice. With the partial incapacity of Dr. William Shepherd, of Sheepshead Bay, in 1907, Dr. McCully soon acquired a near monopolistic entrenchment on the Thoroughbred turf of New York.

Constantly under high nerve tension and not enjoying the best of health, being afflicted with asthma for many years, he was a hard, relentless taskmaster for his associates in the conduct of his practice. But a superlative degree of business acumen, tact, diplomacy and psycho-analytical ability won for him the confidence of leaders in the business and social world, and this, together with the latitude given less fortunate individuals, who could not meet their obligations promptly, and a vast amount of professional service rendered gratis, gave him a dominating position among his profession on the turf.

Dr. McCully joined the A. V. M. A. in 1901. He is survived by a sister, Mrs. Alice DeLine, of Hillsboro, Ore.

H. C. C.

DENNIS A. FOX

Dr. Dennis A. Fox, of Winn, Michigan, died at his home, January 15, 1928. He was a graduate of the Grand Rapids Veterinary College, class of 1917, and was in general practice. He is survived by his widow, one daughter and two sons.

ROY L. BURGER

Dr. Roy L. Burger, of Long Lake, Mich., died at his home, March 22, 1928, after an illness of several months. He was in his 56th year. Following his graduation from the Grand Rapids Veterinary College, Dr. Burger practiced at Ionia, Michigan, until 1918, when he moved to Long Lake. He is survived by his widow, one son and one sister.

BRINSON CARL DAVIS

Dr. B. C. Davis, of Carrollton, Mo., died April 2, 1928, after a protracted illness.

Born at Lena, Mississippi, February 9, 1876, Dr. Davis received the degree of B. S. from the National Normal University before studying veterinary medicine. He located at Carrollton immediately upon his graduation from the Kansas City Veterinary College in 1904 and built up a fine practice in that community.

Dr. Davis joined the A. V. M. A. in 1922. He was a member and past president of the Missouri Veterinary Medical Association.

ELMER A. ASSMAN

Dr. Elmer A. Assman, of Camp Chase, Ohio, died April 27, 1928, at the age of 37 years. Death was due to cerebral hemorrhage. Dr. Assman was a graduate of Ohio State University, class of 1921. He was in the employ of the Columbus (Ohio) *Evening Dispatch* at the time of his death. He is survived by his widow, one daughter, one son and two brothers.

FRANCIS GALLAGHER

Dr. Francis Gallagher died at his home in Camden, N. J., May 11, 1928, after a brief illness. He was a graduate of the New York State Veterinary College at Cornell University, class of 1906. For some years following his graduation, Dr. Gallagher was in the service of the Bureau of Animal Industry and later entered private practice. He is survived by two sisters and two brothers.

JOHN H. SUMMERS

Dr. John H. Summers, of Oxford, Ohio, died May 18, 1928, under distressing circumstances. He was suffering from a head-

ache and went to his medicine cabinet to get a dose of medicine to relieve his headache. He did not have his glasses on and picked up a bottle containing tincture of gelsemium. He did not realize the seriousness of his error, but went to dinner in a nearby restaurant. He ate a hearty meal, arose and started for the door. There he staggered and collapsed. In less than an hour he was dead, in spite of the heroic efforts of physicians.

After graduating from the Ontario Veterinary College in 1896, Dr. Summers located in Oswego, N. Y. Two years later he moved to Oxford, Ohio, where he built up a fine practice and made a host of friends. He was a member of Hamilton Lodge, B. P. O. E., and Invincible Lodge, I. O. O. F. Dr. Summers was a widower and left no children. He was 58 years old.

RUFUS W. FINLEY

Dr. Rufus W. Finley, of Rockford, Ill., died May 20, 1928, after an illness of two years. For three weeks prior to his death, he had been confined to his bed.

Born at Cherry Fork, Ill., February 3, 1863, Dr. Finley attended high school and the Chicago Veterinary College. He was graduated from the latter institution in 1891, with the degree of D. V. S., and in 1895 received the degree of M. D. C. He also was a graduate of the S. S. Hammel School of Elocution and Oratory and the Walter C. Lyman School of Acting.

Dr. Finley located in Rockford about 35 years ago and built up a general practice there. He was active in fraternal circles, being a member of Star in East Lodge, No. 166, A. F. & A. M., the Commandery, Tebala Shrine and Freeport Consistory. He was potentate of the Shrine in 1918. Dr. Finley also held various important offices in the Knights of Pythias. During parades held in Rockford on national holidays, he frequently was at the head of the procession, impersonating Uncle Sam.

Dr. Finley joined the A. V. M. A. in 1922. He is survived by a daughter, two brothers and one sister. Funeral services and burial were held at Clarinda, Iowa.

JEROME F. BUTTERFIELD

Dr. Jerome F. Butterfield, of Riverside, Calif., died June 1, 1928. Born in South Montrose, Pa., May 11, 1846, Dr. Butterfield attended the Ontario Veterinary College and was graduated in 1886. He practiced in his home community in Susquehanna

County, Pennsylvania, until 1911, when he removed to California. He practiced in his new location for a few years, but had practically retired from active work. Dr. Butterfield held Certificate No. 7, granted under the Veterinary Practice Act of 1905, by the Pennsylvania State Board of Veterinary Medical Examiners. The five members of the Board held certificates 1 to 5, so Dr. Butterfield was one of the first to be licensed under the 1905 law, which required annual registration in Pennsylvania.

Dr. Butterfield is survived by his widow, two sons and one daughter. Members of the veterinary profession were pallbearers at the funeral.

ACE OVERTON DONOHEW

Dr. A. O. Donohew, of Boonville, Mo., died May 29, 1928, at St. Joseph Hospital, Boonville, after an illness of two weeks. Death was due to septicemia, following injuries received while treating a patient.

Born in Mt. Sterling, Ky., August 17, 1865, Dr. Donohew came to Missouri with his parents when five years of age, locating at Lamonte. He attended the University Veterinary College, Kansas City, and was graduated in 1903. He practiced at Slater and Fayette, before locating at Boonville.

Dr. Donohew was affiliated with the Knights of Pythias and the I. O. O. F. He is survived by his widow and two daughters.

WARNER SIDENER

Dr. Warner Sidener, of Danville, Ill., died June 12, 1928. Heart disease was the cause of death.

Born January 25, 1879, at Crawfordsville, Ind., he attended high school and saw three years of military service at the time of the Spanish-American War. He entered the Indiana Veterinary College and was graduated in 1909. He again entered military service during the World War, serving for fourteen months.

Dr. Sidener joined the A. V. M. A. in 1920. He was also a member of the Illinois State Veterinary Medical Association. He is survived by his widow, two daughters, one brother and two sisters.

WILLARD L. TRAWVER

Dr. Willard L. Trawver, of Des Moines, Iowa, is reported to have been killed in an automobile accident, over a year ago. He was a graduate of the Kansas City Veterinary College, class of 1916, and practiced at Corning, Iowa, for a while.

CLARENCE W. CLARK

Dr. Clarence W. Clark, of Ashland, Wis., died at a local hospital, June 18, 1928. Death was due to septicemia which developed following an operation performed a few days previously. He was about 50 years of age.

Born in Hamilton County, Indiana, Dr. Clark secured his veterinary training at the Chicago Veterinary College. He was a member of the class of 1910. He practiced at Hagerstown, Ind., Rice Lake and Park Falls, Wis., before locating at Ashland, where he practiced for about ten years.

Dr. Clark joined the A. V. M. A. in 1912. He was also a member of the Wisconsin Veterinary Medical Association. He is survived by his widow, two children and two brothers.

CLEVE S. PULLEN

Dr. Cleve S. Pullen, of Detroit, Mich., 48 years of age, died at his home, June 8, 1928, after a three-day illness. He had suffered from heart trouble for several years. Dr. Pullen was a graduate of the Grand Rapids Veterinary College, class of 1909, and practiced at Fowlerville, Mich., until 1912, when he located in Detroit. From 1919 to 1923, he was a dairy inspector in the Department of Health. Since 1923, he had been in private practice. He is survived by his widow, an adopted son, and one sister.

TRUMAN EARL GORE

Dr. Truman E. Gore, of Clarksburg, W. Va., died June 18, 1928, after a long illness. He had been a sufferer from diabetes for several years, complicated by frequent attacks of rheumatism. Through all of his long illness, Dr. Gore retained his full mental faculties and genial disposition. He seemed to recognize the seriousness of his condition and accepted it in a characteristically philosophical manner.

Born August 2, 1871, on his father's farm, at Gore, W. Va., he received his veterinary training at the Ontario Veterinary College. Following his graduation in 1895, he returned to Clarksburg and built up a lucrative practice there. He also had extensive holdings in a number of business enterprises in his city.

Dr. Gore was a brother of Hon. Howard M. Gore, governor of West Virginia. During the campaign of his brother for governor, Dr. Gore visited every section of the State and was

highly instrumental in bringing about both the nomination and election of his brother. Dr. Gore took an active part in political affairs, and after his brother was inaugurated, he was a frequent visitor at the executive offices in the role of counselor. He possessed rare good judgment and his advice was always highly valued by those who sought it.

Dr. Gore joined the A. V. M. A. in 1912. He was unquestionably the most widely known veterinarian in his section of the country. The funeral was the largest ever held in Clarksburg, and was attended by prominent persons from all over West Virginia and adjoining states. He is survived by his widow, a son and one daughter.

EDWIN T. MEREDITH

Hon. E. T. Meredith, Secretary of Agriculture in the cabinet of President Wilson, died at Des Moines, Iowa, June 17, 1928, after a protracted illness. Mr. Meredith was editor of a number of well-known agricultural periodicals and he was elected to honorary membership in the American Veterinary Medical Association at the 1920 meeting.

PERSONALS

MARRIAGE

Dr. Lloyd Charles Moss (Wash. '23)to Miss Gladys Elnora Shumaker, both of Honolulu, Hawaii, June 6, 1928.

PERSONALS

Dr. Albert E. Lauts (K. S. A. C. '28) has located at Spencer, Nebr.

Dr. F. W. Godsall (Chi. '02) has located for practice at Kewanee, Ill.

Dr. W. E. Welsh (Iowa '27) is Dairy and Food Inspector of Hibbing, Minn.

Dr. M. L. Bryant (Corn. '21) has removed from Montpelier, Vt., to Middlebury, Vt.

Dr. W. A. Browne (K. S. A. C. '28) has located for practice at Cottonwood Falls, Kans.

Dr. Harry W. Eggleston (Corn. '14) has removed from Alden, N. Y., to Wellsboro, Pa.

Dr. H. C. Berger (Cin. '17), formerly of Cincinnati, Ohio, is now located at Prentiss, Miss.

Dr. R. K. O'Neil (Corn. '27) is associated with Dr. F. D. Egan (Ont. '23), of Detroit, Mich.

Dr. F. L. Cusack (Chi. '92), of Carrington, N. Dak., is sheriff of Foster County, N. Dak.

Dr. D. B. Pellette (K. S. A. C. '12), formerly of Madison, Fla., is now located at Monticello, Fla.

Dr. D. D. Ford (Corn. '27) is practicing with Dr. F. E. McClelland (Corn. '09), of Buffalo, N. Y.

Dr. John N. McIllnay (K. S. A. C. '28) is associated with Drs. Norden and Perrin, of Lincoln, Nebr.

Dr. C. L. Miller (O. S. U. '22) announced the opening of his new Oak Park Animal Hospital, at Oak Park, Ill., June 1.

Dr. J. B. Paterson (Edin. '78), formerly located Ogema, Sask., is now in Regina, Sask. Address: 4177 Victoria Ave.

Dr. J. C. Nowlen (Chi. '18), of Woodstock, Ill., has received an appointment to the staff of the state veterinarian of Illinois.

Dr. N. S. Mayo (Chi. '89), of North Chicago, Ill., will sail for Europe on July 12. Mrs. Mayo will accompany him.

Dr. J. W. Roberts (Chi. '17), of Galena, Ill., has sold his practice to Dr. G. W. Evert (Chi. '05) and will move to Warren, Ill.

Dr. O. W. Winters (Ont. '04), of Danville, Ill., has been appointed City Veterinarian, succeeding Dr. William Stratman (Chi. '09).

Dr. R. P. Wilson (McK. '04), of Rockford, Ill., is planning the erection of a veterinary hospital to cost in the neighborhood of $35,000.

Dr. Harold McCrillis (Iowa '28) has requested that his JOURNAL be mailed to him at South Union and Park Avenue, Des Moines, Iowa.

Dr. G. W. Evert (Chi. '05) has purchased the practice of Dr. J. W. Roberts, (Chi. '17) at Galena, Ill., and will resume practice at that place.

Dr. Lynn C. Palmer (Mich. '20), formerly of Brooklyn, Mich., is now associated with Dr. E. C. Goodrich (Gr. Rap. '15), of Kalamazoo, Mich.

Dr. Glen L. Dunlap (K. S. A. C. '28) has accepted a position as assistant pathologist at the Massachusetts Agricultural College, Amherst, Mass.

Dr. Charles E. Mummert (Ind. '07), of Young America, Ind., was recently reappointed a member of the Indiana State Live Stock Sanitary Board.

Dr. Stevenson Moore, Jr. (U. P. '27), of Chicopee, Mass., has been appointed Municipal Veterinarian and Inspector of Animals by the Mayor of his City.

Dr. C. A. Dionne (Chi. '11), of Beaverville, Ill., has established a call office at Donovan, Ill. Dr. Dionne will be in Donovan Wednesday of each week.

Dr. E. B. Ackerman (Amer. '91) has removed from his former location on Jerico Turnpike to East Main Street, in the Fort Hill Section, Huntington, L. I.

Dr. J. H. Wilson (Ont. '90), of London, Ont., was promoted to the full rank of Colonel in the Department of National Defense of Canada, March 1, 1928.

Dr. F. S. Jones (U. P. '08), of the Rockefeller Institute for Medical Research, Princeton, N. J., has been given leave of absence to visit Europe and sailed June 9.

Dr. Walter Wisnicky (K. S. A. C. '26), who has been at the University of New Hampshire the past year, has requested a change of address to Fond du Lac, Wis.

Dr. Rafael F. Santa Maria (Havana '10) has requested a change of address from Ave. Estrada Palma No. 25, Camaguey, Cuba to Calle 3a, entre A y B Vedado, Havana.

Dr. G. W. McNutt (Iowa '17), of Clear Lake, Iowa, has taken up the position in anatomy left vacant by Dr. George R. Fowler (Wash. '25), at the State College of Washington.

Dr. A. W. Mebert (Gr. Rap. '07), of Traverse City, Mich., sustained a fracture of his left leg, above the ankle, in a fall he received while engaged in professional work near Kingsley, Mich.

Dr. C. J. Scott (Iowa '08), of Knoxville, Iowa, the energetic secretary of the Iowa Veterinary Medical Association, was a delegate to the Republican Convention in Kansas City, last month.

Dr. A. Prater (Chi. '12), of Cowden, Ill., has accepted a position with the Illinois State Department of Agriculture and has been assigned to tuberculin testing, with headquarters at Waukegan, Ill.

Drs. J. F. Pilon (Chi. '12) and H. S. Wooters (Chi. '13), of Champaign, Ill., have dissolved their partnership. Dr. Pilon will continue to practice at 502 North Hickory St., the old location of the partnership.

Dr. Lionel Stevenson (Ont. '26), who has been in charge of extension work at the Ontario Agricultural College, has been appointed Provincial Zoologist, with headquarters at the Ontario Veterinary College, Guelph.

Dr. Chas. H. Rosenstiel (Chi. '08), of Mt. Carroll, Ill., has purchased a home in Champaign, Ill., and will make his home there for an indefinite period. Dr. Rosenstiel's oldest son will enter the University of Illinois this fall.

Dr. C. N. Bramer (Corn. '23) has resigned his position at the Hinckley Veterinary Hospital, Buffalo, N. Y., and has joined the staff of the new veterinary hospital of Dr. J. V. Lacroix (K. C. V. C. '06), at Evanston, Ill.

Dr. D. M. Moses (Chi. '16), formerly Hamilton County (Ill.) Veterinarian, has been appointed Randolph County (Ill.) Veterinarian, by the County Board of Supervisors. Dr. Moses will have his headquarters at Sparta, Ill.

Dr. J. D. Reardon (McK. '09), manager of the Peoria, Ill., branch of the Royal Serum Company, uses an airplane to make his rounds. He recently made a trip to Adair, Ill., for the purpose of calling on Dr. G. A. Gray (Chi. '10) at that place.

Dr. C. L. Woolard (Chi. '17) has returned from Tampa, Fla., to Benton, Ill., and has resumed practice there. Dr. Woolard was in Florida for three years and held the position of Chief Meat and Milk Inspector for the city of Tampa, while in that city.

Dr. D. R. Herberich (Chi. '20), of Kempton, Ill., recently suffered a painful injury when one of his equine patients almost bit off the thumb of his left hand. A letter from Dr. Herberich, dated June 14, reported the injured member healing nicely.

Dr. W. H. Redhead (O. S. U. '04), of Cleveland, Ohio, was seriously ill with erysipelas during May and confined in the City Hospital. A report, received during the early part of June, indicated that Dr. Redhead had returned home and was slowly regaining his strength.

Dr. J. S. McDaniel (K. C. V. C. '09), who has been associated with Dr. M. E. Gouge, at Sedalia, Mo., for a number of years, recently purchased the practice and equipment of the late Dr. C. A. Donohew, of Boonville, Mo. Dr. McDaniel expects to remain in Boonville permanently.

Dr. Joseph P. Scott (O. S. U. '14), associate professor of pathology, Kansas State Agricultural College, has been granted a sabbatical leave of absence for further studies on anerobic bacteriology. He will pursue these studies in the Department of Bacteriology, University of Colorado School of Medicine, Denver.

Dr. D. A. Yandell (K. S. A. C. '23), who has been with the American Society for the Prevention of Cruelty to Animals, New York City, for the past three years, has resigned his position and has joined Dr. Wm. R. Ecker (O. S. U. '11) in conducting the Newark Dog and Cat Hospital and Clinic, at 787 Clinton Ave., Newark, N. J.

Dr. Hubert Shull (Ont. '16), of Texarkana, Ark., was elected District Governor of the Lions at the convention of District No. 7, held in Fayetteville, Ark., May 21. Dr. Shull served the Lions Club of Texarkana as secretary for a number of years and at a recent election he was elevated to the presidency of the Club.

Dr. H. J. Rollins (K. C. V. C. '16), of Rockingham, N. C., led the field in the Democratic primaries, June 2, 1928, for county commissioner. Twelve men were in the race, including five incumbents whose terms of office were drawing to a close. Dr. Rollins rolled up a handsome vote of 2,555, out of a total of 4,207 votes cast, indicative of the confidence which the good people of Richmond County have in the business integrity of Dr. Rollins.

BUREAU TRANSFERS

Dr. Chas. H. Leavitt (Chi. '06) from Boise, Idaho, to Olympia, Wash., on tuberculosis eradication.

Dr. Oscar M. Webb, Jr., from Chicago, Ill., to Cincinnati, Ohio, on meat inspection.

Dr. Guy M. Parrish, Jr. (A. P. I. '15), from Raleigh, N. C., to Columbia, S. C.

Dr. Arthur Salinger (U. P. '94), from Newark, N. J., to New York, N. Y., on meat inspection.

Dr. George D. Loder (McK. '18), from Sacramento, Calif., to Portland, Ore., on meat inspection.

Dr. Wm. C. Dye (K. C. V. C. '08), from Reno, Nevada, to Salt Lake City, Utah, on field inspection.

Dr. Joseph A. Wilkinson (U. P. '07), from Chicago, Ill., to Forth Worth, Texas, on tick eradication.

Dr. Daniel C. Becker, Jr., from Chicago, Ill., to Fort Worth, Texas, on tick eradication.

Dr. James C. Burneson (Ont. '91), from Chicago, Ill., to Dayton, Ohio, on meat inspection.

Dr. Thomas V. Coe (O. S. U. '11), from Dayton, Ohio, to Columbus, Ohio.

Dr. Lawrence Lewis, Jr. (Chi. '09), from Chicago, Ill., to Phoenix, Ariz., on meat inspection.

Dr. H. B. Raffensperger (Chi. '09), from Chicago, Ill., to Miles City, Mont., in charge of zoological laboratory.